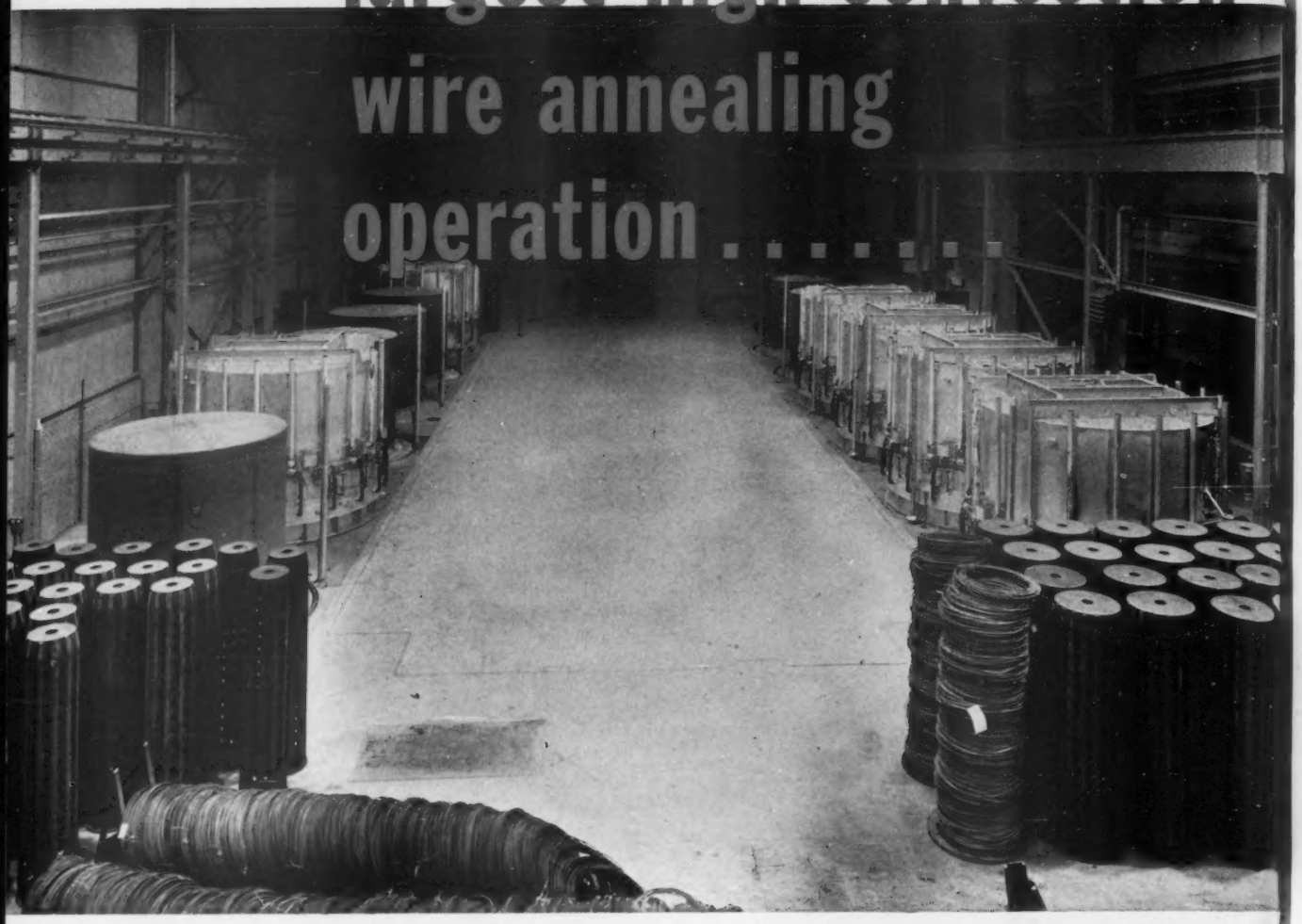
# WIRE AND WIRE PRODUCTS

AUGUST 1958


## MORGAN CONNOR WIRE DRAWING MACHINES

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

# Here is America's largest high convection wire annealing operation . . . . . .



## *it's the largest installation of the largest furnaces*

For the first time it is possible to anneal four large spindles of rod in a single charge in the efficient bell type high convection furnace.

Lee Wilson engineers recently set into operation six of the largest bell type radiant tube high convection furnaces ever built. With a charge diameter of 114" and a piling height of 108", these rod and wire coil annealing furnaces have a heat input of 5,000,000 BTU per hour per furnace.

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***MAKE THE BEST METALS BETTER***

*ORIGINATORS AND LEADING PRODUCERS OF HIGH CONVECTION ANNEALING FURNACES

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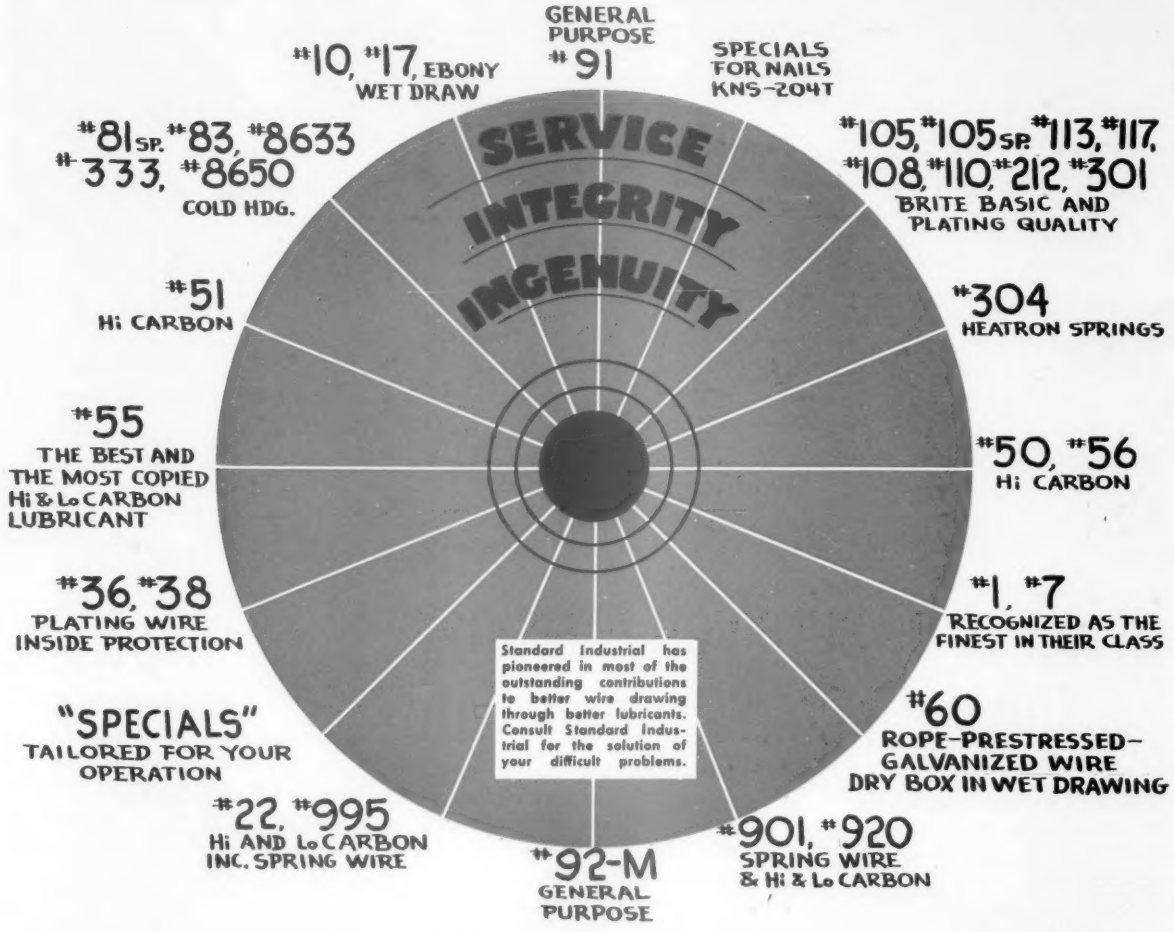
## *"America's Finest Wire Draw"*

**We of Standard have concentrated our efforts, since our inception, toward the development of lubricants to solve your drawing problems!**


GENERAL PURPOSE #91
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#81 SP. #83, #8633 #333, #8650 COLD HDG.
#105, #105 SP. #113, #117, #108, #110, #212, #301 BRITE BASIC AND PLATING QUALITY
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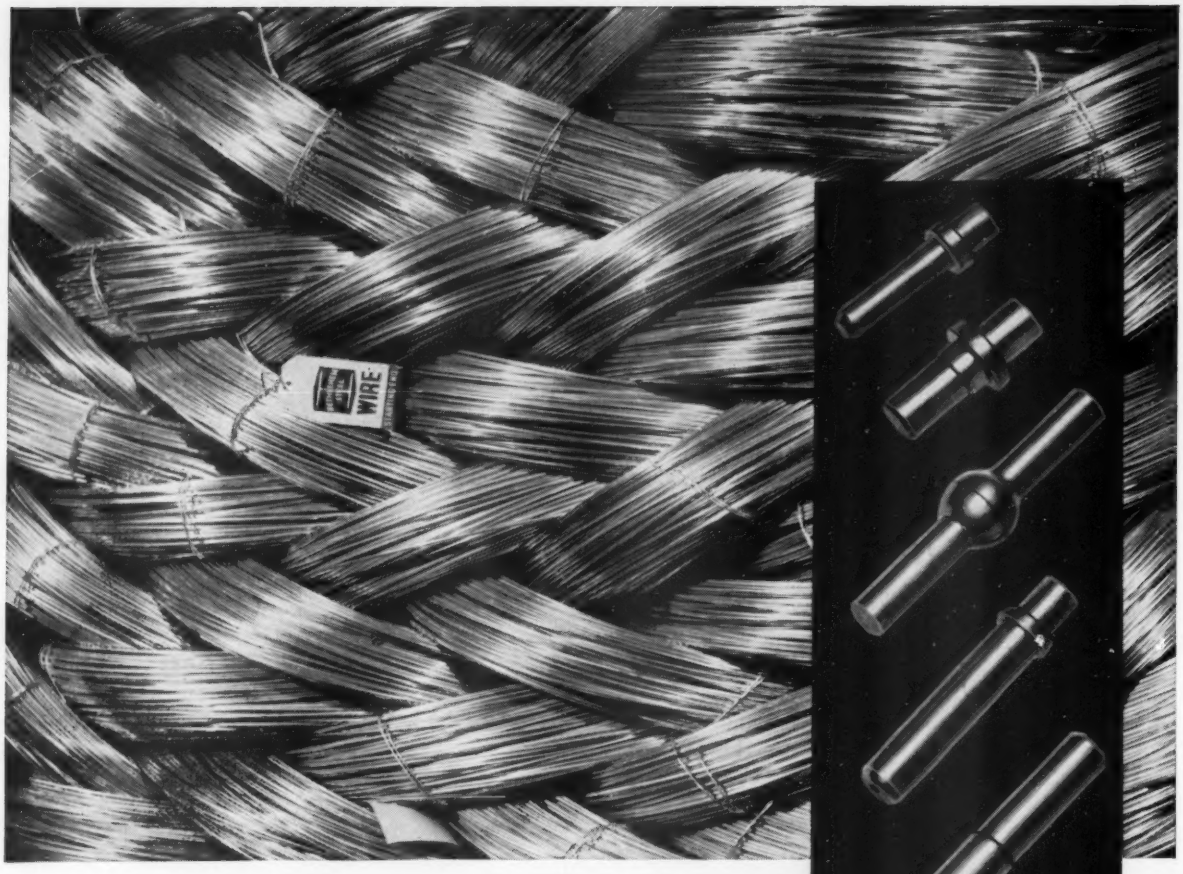


# How to be sure you're using the right cold-heading wire

It pays to be fussy about the grade of cold-heading wire you use in operations like upsetting, forging or roll-threading. The job is half licked when you start with the correct type of steel wire.

Steel wire for cold-heading is a Bethlehem specialty. There are many ways in which our experience might prove helpful in bettering your production of cold-headed items.

At your invitation we will gladly study your products, equipment and process . . . and recommend the grade of steel that will perform the best. Then we'll carefully produce the steel to meet your needs.

Bethlehem cold-heading-quality wire is made to rigid standards. It is uniform in analysis and free from injurious surface defects. Thorough inspection at every stage of production typifies the quality-control that's behind every ton we ship.

One of our technical men will be glad to discuss cold-heading with you—or any other application of steel wire. Bethlehem makes nearly all kinds of steel wire. Just phone the nearest Bethlehem sales office, or drop a line to the address below.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

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**BETHLEHEM STEEL**

BETHLEHEM STEEL

# these thermatic Series* extruder

## features mean higher production on every job!

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Extra large capacity stainless steel hoppers.

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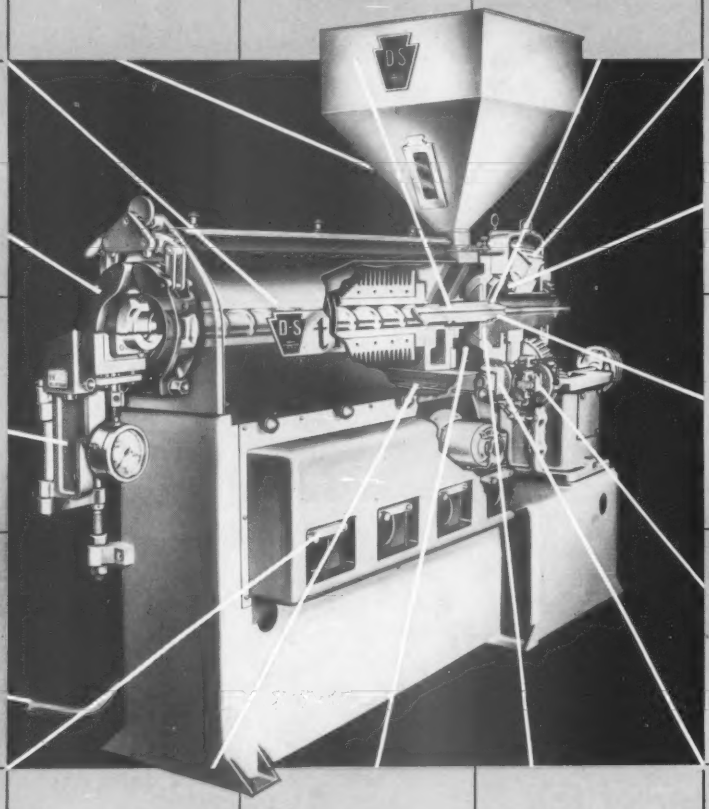

Higher thrust bearing capacity. Extra-heavy separate thrust and radial bearings handle their respective loads individually to meet constantly increasing production requirements.

Improved hinged head support swings completely clear of the front of the extruder.

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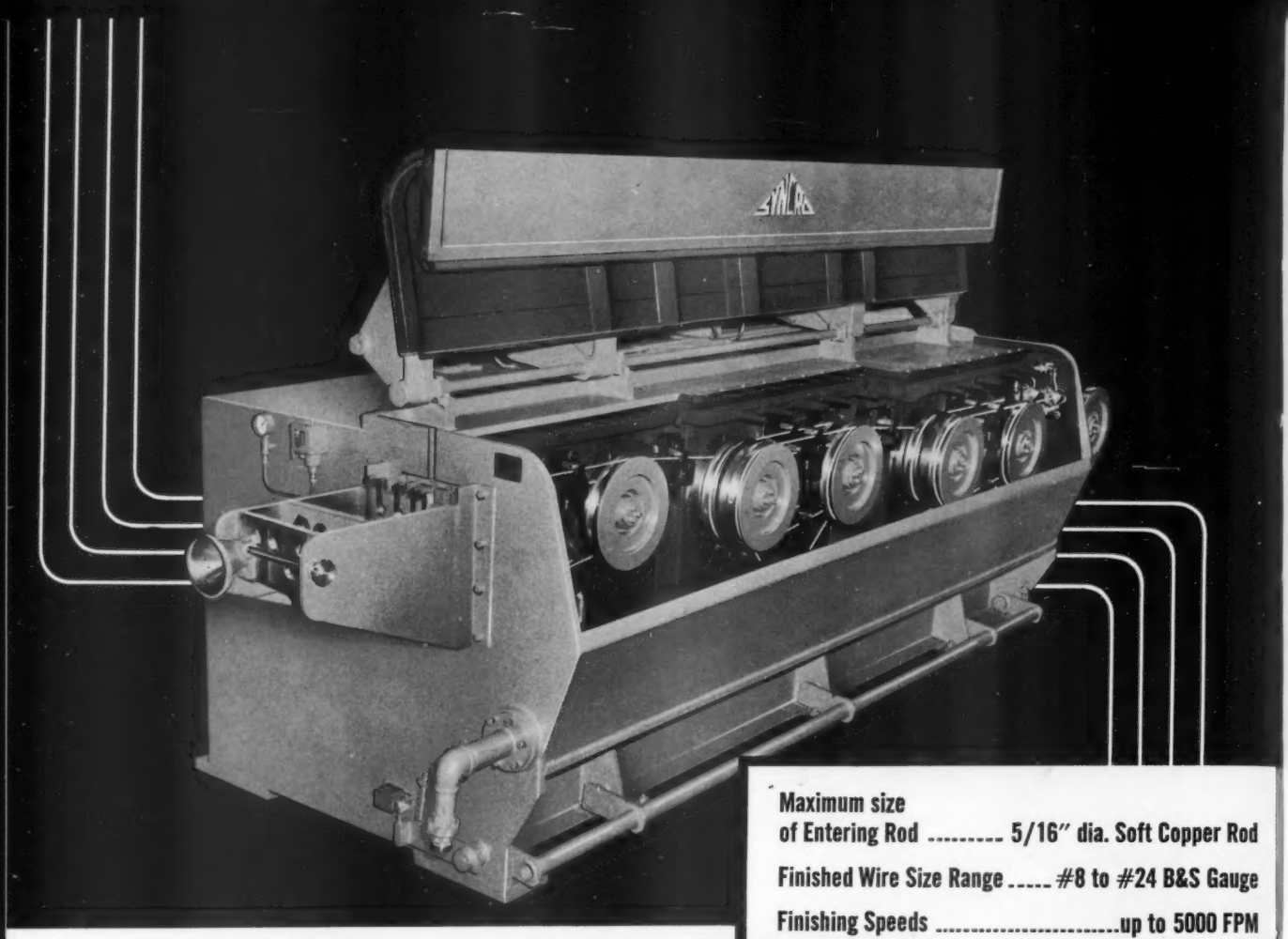

**Maximum size**
**of Entering Rod ..... 5/16" dia. Soft Copper Rod**
**Finished Wire Size Range ..... #8 to #24 B&S Gauge**
**Finishing Speeds .....up to 5000 FPM**

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- Anti-friction bearings used throughout
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# WIRE AND WIRE PRODUCTS*

Reg. U. S. Pat. Off.

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 33 August, 1958 No. 8

Designated as Official Publication By The Wire Association


## Contents


Wire Association Convention Announcement ..... 850
Wire Association Convention Program ..... 888-889
The Wire Outlook ..... 865
The Regional Meeting in Los Angeles ..... 867
The Merits of Large Coils
by Robert W. Davis ..... 870
Problems in Spring Making
by William K. Gardner ..... 871
Some Problems of the Manufacturers of Low Carbon Steel Wire Products
by G. Leslie Killian ..... 871
Conductor Economics
by Edward S. McGlone, Jr. ..... 873
Thermalex-F
by Frank Cianchetti ..... 876
The Function of the American Iron and Steel Institute Product Manuals
by W. C. Clements ..... 877
Rod Packaging
by J. S. Laver ..... 879
Automatic Preparation of Stranded Cable for Terminations
by W. Scott and J. L. Harper ..... 882
New Radiant Tube Furnaces for Processing in Galvanizing and Patenting Lines
by William D. Bawden ..... 885
Simplified Construction of Reel Capacity Charts
by Wm. Owens, Jr. ..... 890
Outstanding Personalities of the Wire Industry ..... 903
A Review of Recent Wire Patents ..... 910
Copper Statistics ..... 916
Steel Statistics ..... 917
Index to Advertisers ..... 935
Where-to-Buy ..... 936-940



WIRE and WIRE PRODUCTS is indexed regularly by
Engineering Index, Inc., New York, N. Y.
The H. W. Wilson Co., New York, N. Y.

RICHARD E. BROWN, President and Publisher

R. S. Spengel, Secy.-Treas. & Gen'l. Manager
J. Edward Donnellan, Vice-President

Edmund D. Sickels, Editor

— ASSOCIATE EDITORS —
Rommel, Allwine & Rommel, Consultants on Patent Information

Publication Office: Jersey City, N. J.
Executive Office: 453 Main St., Stamford, Conn.
* Reg. U. S. Pat. Off.

WIRE & WIRE PRODUCTS, Vol. 33, No. 8, August, 1958. Publication Office at One Sherman Avenue, Jersey City, N. J. Executive Office 453 Main Street, Stamford, Conn. Published monthly by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Sec'y and Treas. Subscription Price: U. S. $8.00; Canada, $8.00 per year; Domestic 75 cents per copy; Foreign 90 cents per copy, except October Convention Issue and January Proceedings Issue, $1.25 per copy; Foreign $10.50 per year. Entered as second class matter at the Post Office, Jersey City, N. J. under the act of March 3, 1879.


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REPUBLIC PROVIDES FAST DELIVERY
On Over 100 Sizes of
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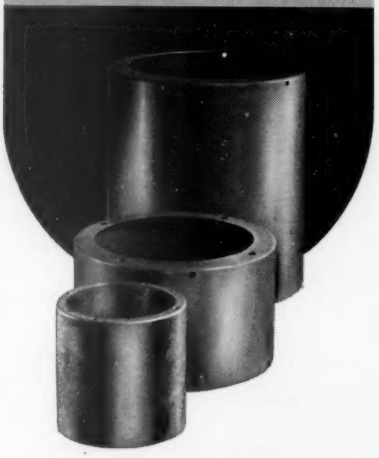

Made as light as 18-gage steel in sizes from 12" to 56" in diameter and from 6" to 48" in length.

Plain, painted or hot dipped galvanized finish meets requirements for plain or coated wire and cable.

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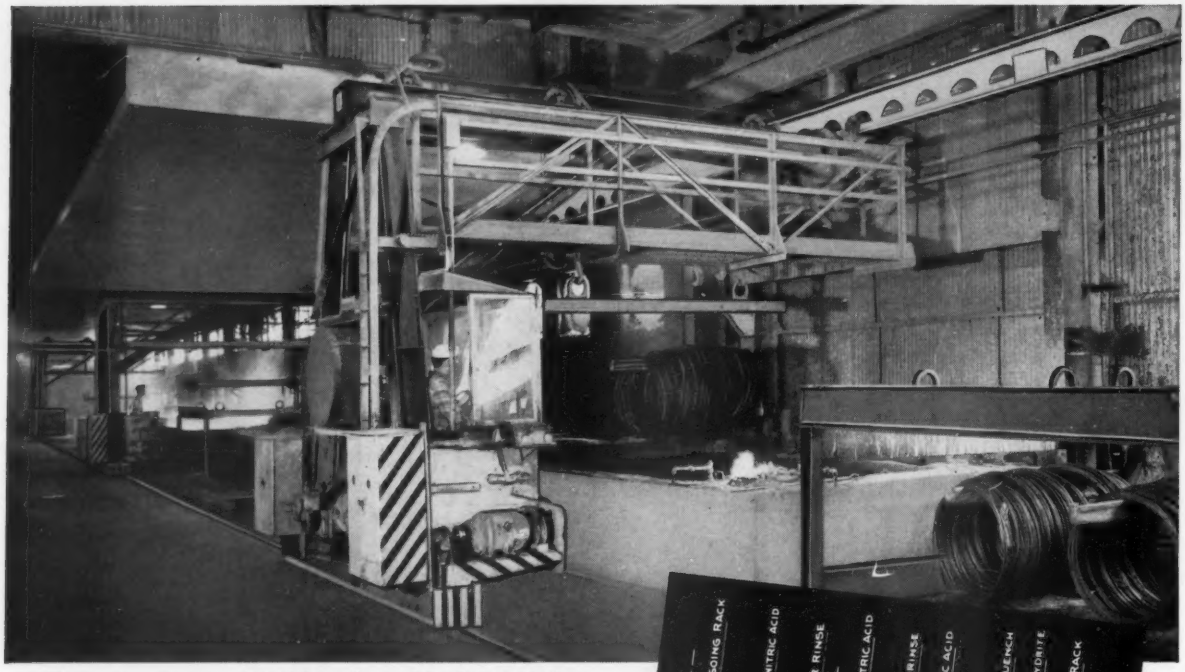
# WIRE PRODUCTION SPEEDED
## WITH STRAIGHT-LINE CLEANING PROCESS



Three gantry cranes operate at high speed around the clock in this cleaning house. Note how clean and orderly this room is. These are contributing factors to the high production rate secured.

## THREE GANTRY CRANES ON SAME LINE PROVE HIGHLY ADVANTAGEOUS

Thousands of tons of wire are cleaned monthly by three especially designed Cleveland Tramrail gantry cranes working 24 hours a day, seven days a week, in the cleaning house of an important stainless steel producer.

Each crane is assigned to a section of the straight-line layout. The first crane picks up loaded hooks of wire from a rack and dunks them in a sodium hydrite tank and a water quench. Then the second crane takes over, advancing the wire through a sulfuric acid tank, water rinse and hot nitric acid bath. The third crane carries them through a water rinse and cold nitric acid tank and places them on the outgoing rack.

The efficiency which a straight-line layout with gantry cranes introduces in a cleaning house is usually an eye-catching figure. Man-hours required for cleaning a given amount are generally reduced from one-third to one-half over that for old-fashioned cleaning methods. In addition, a 50% saving in floor space is made. Another important feature is the cleanliness that it makes possible. To operate in a clean, orderly room not only aids production, but is more healthful for employees and boosts their morale.

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Spoolers are electromagnetically controlled.

Spool weights up to 450 pounds.

Transversal spooling by endless nylon tape with grip magnets.

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• If your product involves the use of wire—PAGE asks—*"Can a new wire specification help make your product a better value?"* PAGE has helped many manufacturers to do so and—without increasing their manufacturing cost.

Here at PAGE we are in an ideal position to work with wire users in developing better wire for specific needs. PAGE is a specialty wire mill. Manufacturing wire has been our sole business since 1902.

Our engineering and production staffs regard wire as an important tool which can be designed and made to fill the exact requirements of our customers. Over the years PAGE has maintained a progressive attitude which has pioneered many "**firsts**" in the wire business. Among this list are items such as—

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**" " to use Tungsten Carbide Dies**
**" " commercial producer of Aluminized Wire**
**" " to produce and promote Stainless Steel Strand**
**" " Woven Wire Fence**
**" " Stainless Steel Fence**
**" " All-Aluminum Fence**

Above all, PAGE is a dependable wire source. Many of our customers have grown with PAGE for nearly half a century. PAGE experience, talents and facilities are available to you at all times. We will be glad to work with your people in analyzing your wire needs, and if found advisable, in developing a new wire specification which may add to the usefulness and value of your own product.

## PAGE - a Dependable Source for GENERAL WIRE

Partial list of PAGE General Wire materials, sections and special purpose wires:

| MATERIALS | SECTIONS |
|---|---|
| Low Carbon | Rounds |
| High Carbon | Half Rounds |
| Low Alloy | Ovals... Flats |
| Stainless Steel | Half Ovals |
| Armco Ingot Iron | Squares |
| Aluminized | Special Shapes |

### SPECIAL PURPOSE WIRES

| | |
|---|---|
| Aircraft | Signal Corps |
| Antenna | Spiral Binding |
| Armature Banding | Spring, Mechanical |
| Belt Hook | Spring, Upholstery |
| Broom | Stapling |
| Buckle | Stitching, Automotive |
| Button Fastening | Strand |
| Clip | Telephone |
| Core (ACSR) | Telegraph |
| Hairpin | Thermocouple |
| Lashing | Tire Bead |
| Lock Washer | Weaving |
| Safety, Lock | Welding |
| Shaped (see next column) | (see next column) —and others |

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**Many Grades** • We furnish Shaped Wire in Low or High Carbon, Aluminized, Low Alloy or Stainless Steel, and in Armco Ingot Iron.

**Many Sizes** • Cross-section areas to and including .0625 sq. in. Flats and rectangles to 3/8" (width-thickness ratios to 6:1). Also rounds, half rounds, ovals, half ovals, squares, and specials.

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***(SPECIAL NOTE** • We do not stock finished shapes We manufacture to customer specification)*

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Here is a 16-page booklet that is crammed full of useful information of value to every wire user. It tells you how to cut costs with PAGE Shaped Wire. It gives complete information on available grades of steel...tempers and finishes...size range, etc. It explains what information to include on inquiries and orders.

Also, **Booklet DH1226** contains page after page of useful standard tables, among which are:

- **Mensuration Factors • Carbon and Alloy Steel Weights**
- **How to Calculate Areas of Common Shapes**
- **Physical Properties of Steel Wire**
- **Decimal Equivalents • and many other useful tables**

You will find this booklet of great value.
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**"ACCO ALUMINIZED" WIRE**

***Folder DH537*** • You will want the complete facts on the amazing new "ACCO ALUMINIZED" wire—the wire that combines the strength of steel with the corrosion-resistance of aluminum. **Folder DH537** explains how this revolutionary new wire provides double protection...tells how its unusual physical properties make it superior for almost endless regular and special wire applications. "ACCO ALUMINIZED" wire is an exclusive PAGE product.

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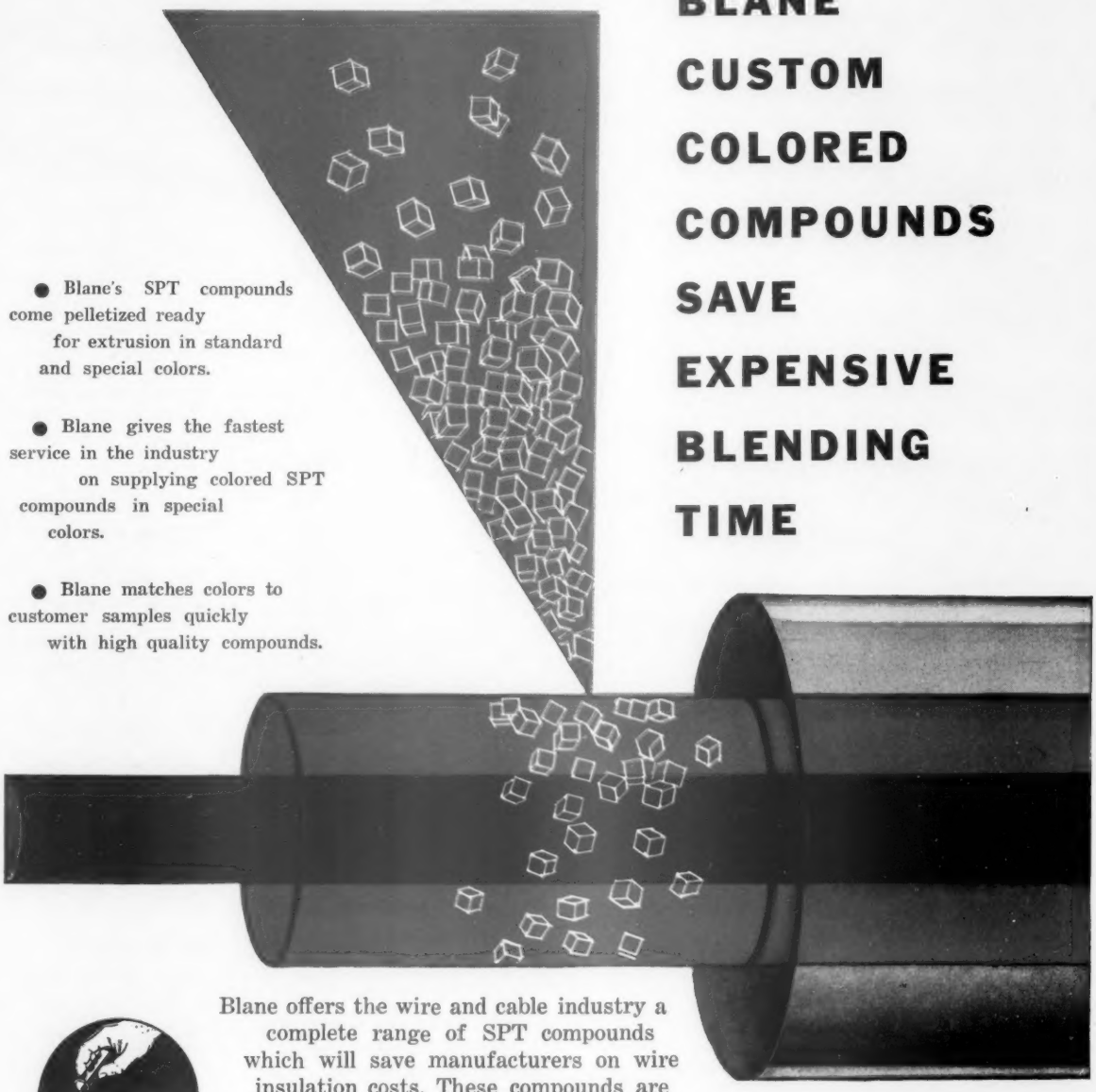
# BLANE
# SPT
# COMPOUNDS



## BLANE CUSTOM COLORED COMPOUNDS SAVE EXPENSIVE BLENDING TIME

- Blane's SPT compounds come pelletized ready for extrusion in standard and special colors.
- Blane gives the fastest service in the industry on supplying colored SPT compounds in special colors.
- Blane matches colors to customer samples quickly with high quality compounds.

Blane offers the wire and cable industry a complete range of SPT compounds which will save manufacturers on wire insulation costs. These compounds are designed to meet UL requirements. And Blane laboratory specialists are ready to assist you on any color problem. Write for samples, technical data, and prices.

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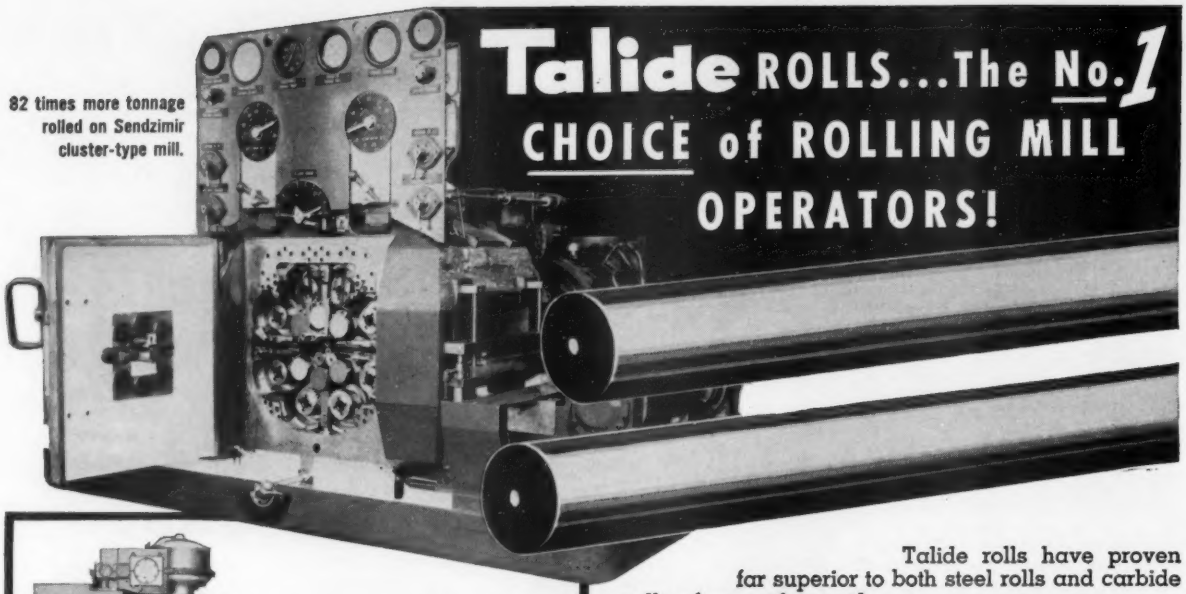
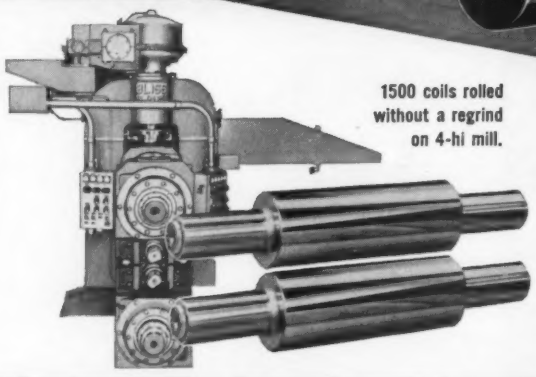
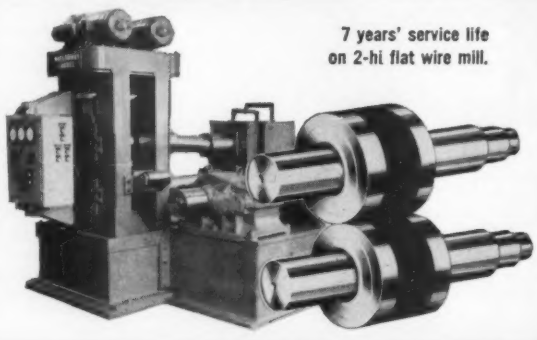


82 times more tonnage rolled on Sendzimir cluster-type mill.



1500 coils rolled without a regrind on 4-hi mill.



7 years' service life on 2-hi flat wire mill.

Talide rolls have proven far superior to both steel rolls and carbide rolls of any other make.

During the last six years Talide rolls have been adopted by every major strip steel producer. Metal Carbides pioneered and developed tungsten carbide rolls and successfully adapted them to all types of rolling mills including STECKEL, BLISS, UNITED, MESTA, STANAT, SENDZIMIR, WATERBURY-FARREL, TORRINGTON, RUESCH, FENN, WEAN, COLD METAL, etc.

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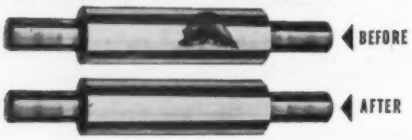
## ONLY TALIDE WORK ROLLS GUARANTEE THESE ADVANTAGES

- ★ MORE PRODUCTION
- ★ IMPROVED PHYSICALS
- ★ BETTER FINISH
- ★ GREATER REDUCTION
- ★ LONGER LIFE
- ★ LESS DOWN TIME
- ★ HIGHER SPEEDS
- ★ FEWER REJECTS
- ★ CLOSER TOLERANCE
- ★ LESS MAINTENANCE

## EXCLUSIVE REPAIR SERVICE




Broken or damaged carbide rolls can be re-worked to first class condition with all defects eliminated at one-half original cost. Only Metal Carbides offers this service—because of its exclusive hot press method.

Talide Rolls are made in lengths up to 100", diameters up to 25", and up to 5000 lbs. by weight.

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Youngstown 12, Ohio
Send for new 76-page catalog 56-G.

## SUPERSET GRINDING WHEEL

The Superset diamond grinding wheel was specially developed for grinding carbide rolls to highest possible surface finish and luster. Made of 4-8 micron size diamond dust, it imparts a surface finish far superior to any other commercial wheel. Available in sizes up to 25" diameter.

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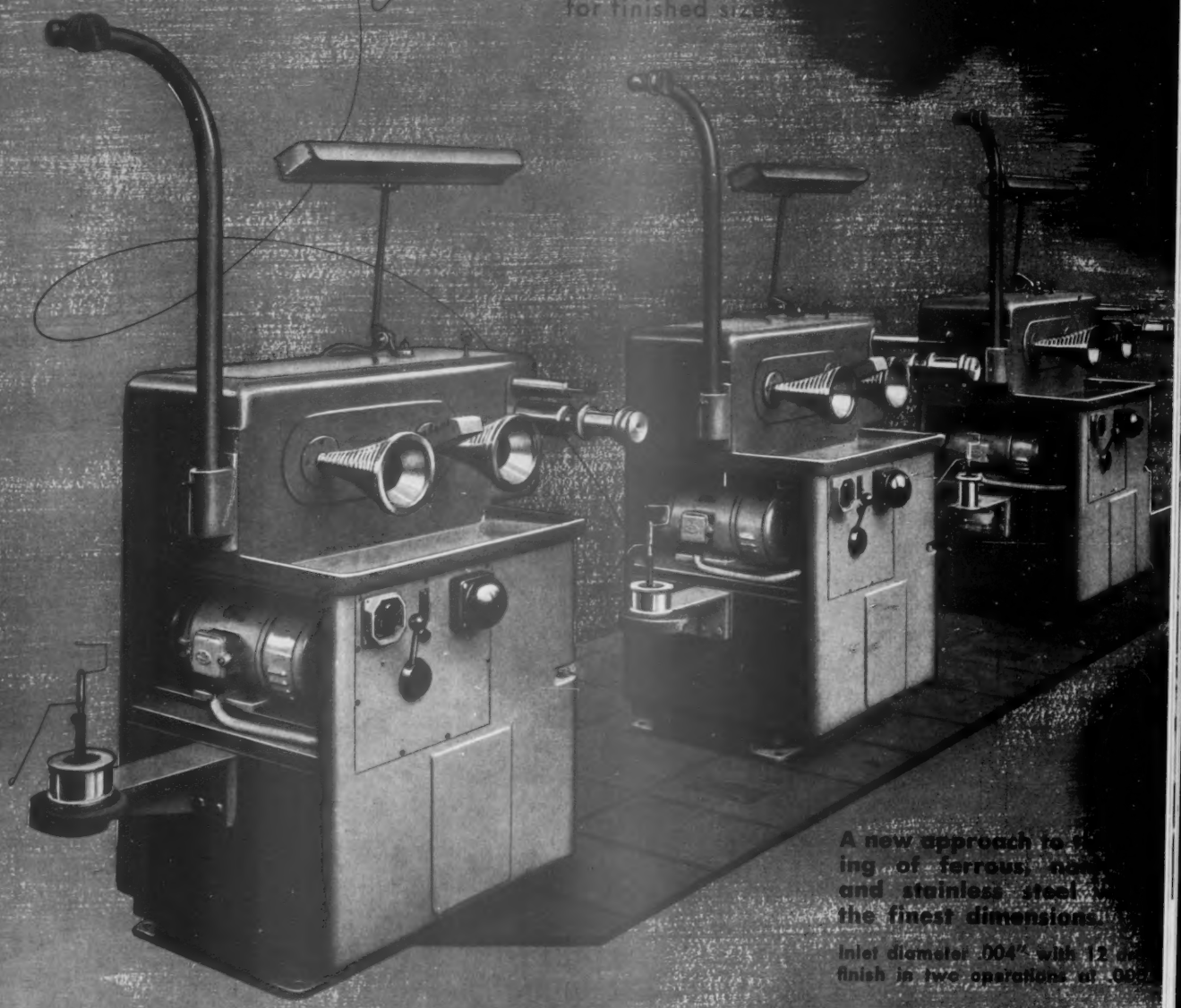
HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

# HERBORN

Wire D

MODEL F VI

for finished sizes



A new approach to ing of ferrous, no and stainless steel the finest dimensions

Inlet diameter .004" with 12 finish in two operations at .00

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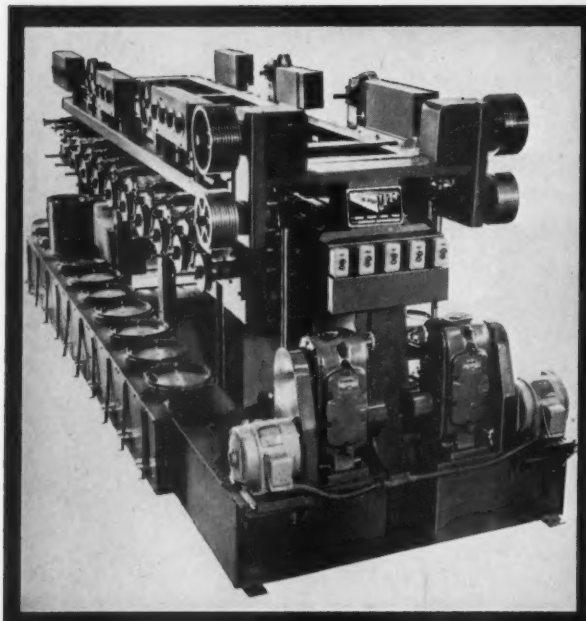
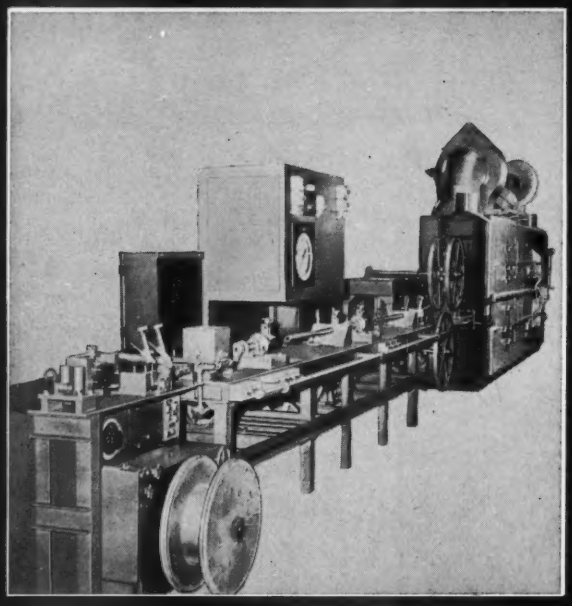


## New Reel-R-Drum Packer handles two wire sizes simultaneously at different speeds through the same process.

MOCO's new Reel-R-Drum Packer is setting production records in forward-looking companies. This versatile unit has a speed range from 20 to 120 feet per minute. You can produce two wire sizes simultaneously through the same process at different speeds. Handling wire sizes ranging from .0089″ to .025″ in diameter, this MOCO Reel-R-Drum packages annealed copper magnet wire on different reels or in nominal 100 lb. capacity Payoffpak Drums, or both simultaneously. This versatile unit is built for tandem operation with a high speed MOCO type "C" wire enameling machine.

## New MOCO Machine applies 2 servings of glass or yarn and 4 coats of baked insulating varnish

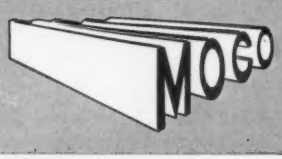
Satisfied users acclaim this new insulating, impregnating and varnish baking machine as a completely revolutionary development in the field of wire enameling. It is capable of turning out large quantities of heavy rounds and rectangulars (up to 150 M. Sq. Mls. Cross Sectional Area), baking on 4 coats of insulating varnish and applying two servings of glass or textile yarns . . . simultaneously! MOCO's revolutionary Rapid-Cool Oven lets you stop production without damage to wire in the oven. Return to full production in a matter of seconds because of the rapid rise of the temperature inside this MOCO Tunnel Oven.

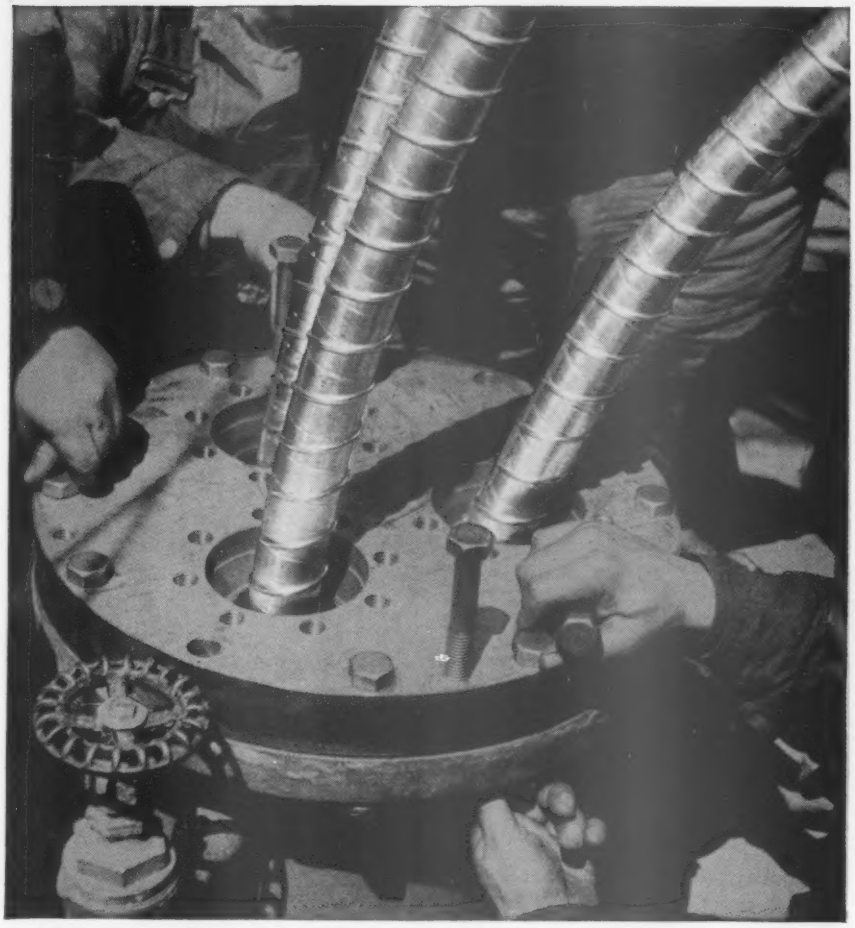


FOR MORE INFORMATION

**MICHIGAN OVEN COMPANY**

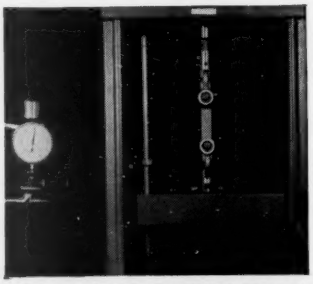
425 BRAINARD • DETROIT 1, MICHIGAN WI-58



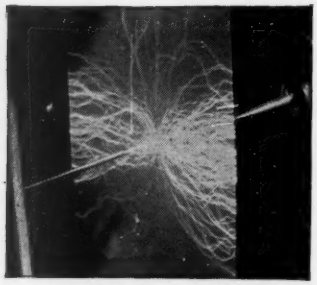


## PROPERTIES OF "MYLAR"

"Mylar" offers a unique combination of properties that may help you improve performance and lower costs of *your* product. Here are two of the many important properties for evaluation.



**HIGH TENSILE STRENGTH.** "Mylar" is strong and durable. Instron Tester shows an average strength of 20,000 psi. It's dimensionally stable . . . resists moisture.



**HIGH DIELECTRIC STRENGTH.** Average of 4,000 volts per mil . . . average power factor of 0.003 to 60 cycles .

*General Cable reports . . .*

# New shielding assembly with Du Pont Mylar® limits oil drainage . . . restricts moisture pickup

**PROBLEM:** To provide an outer shielding assembly on General Cable's high-voltage, high-pressure pipe-type cable. The assembly had to resist oil drainage during shipment and storage as well as restrict surface-moisture pickup during installation.

**SOLUTION:** After extensive tests on various materials, General Cable Corporation adopted two new tapes for the outer shielding assembly . . . one tape was "Mylar"* polyester film; and the other, a "Mylar"/foil lamination.

**RESULTS:** General Cable tests showed that "Mylar" provided a tight, yet flexible, assembly and effectively reduced oil drainage. The high tensile strength and other excellent physical properties of "Mylar" permit its application to the cable under high tension. "Mylar" restricts surface-moisture pickup when the cable is exposed to air during installation. "Mylar" is not affected by the insulating oils . . . has no plasticizer . . . will not contaminate other materials.

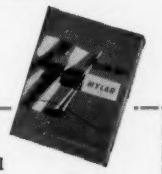
**How can "Mylar" help you?** Whether you manufacture heavy-duty cable or tiny capacitors, it will pay you to evaluate the combination of properties found only in "Mylar." And when figured on an area basis, this tough, thin polyester film will often *cost less* than your present insulating material. For more detailed information, send in coupon.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

DU PONT **MYLAR**® POLYESTER FILM

*"MYLAR" is Du Pont's registered trademark for its brand of polyester film.




E. I. du Pont de Nemours & Co. (Inc.)
Film Dept., Room EG-8, Nemours Bldg., Wilmington 98, Del.

Please send the new booklet listing properties, applications and types of "Mylar" polyester film available (MB-11).

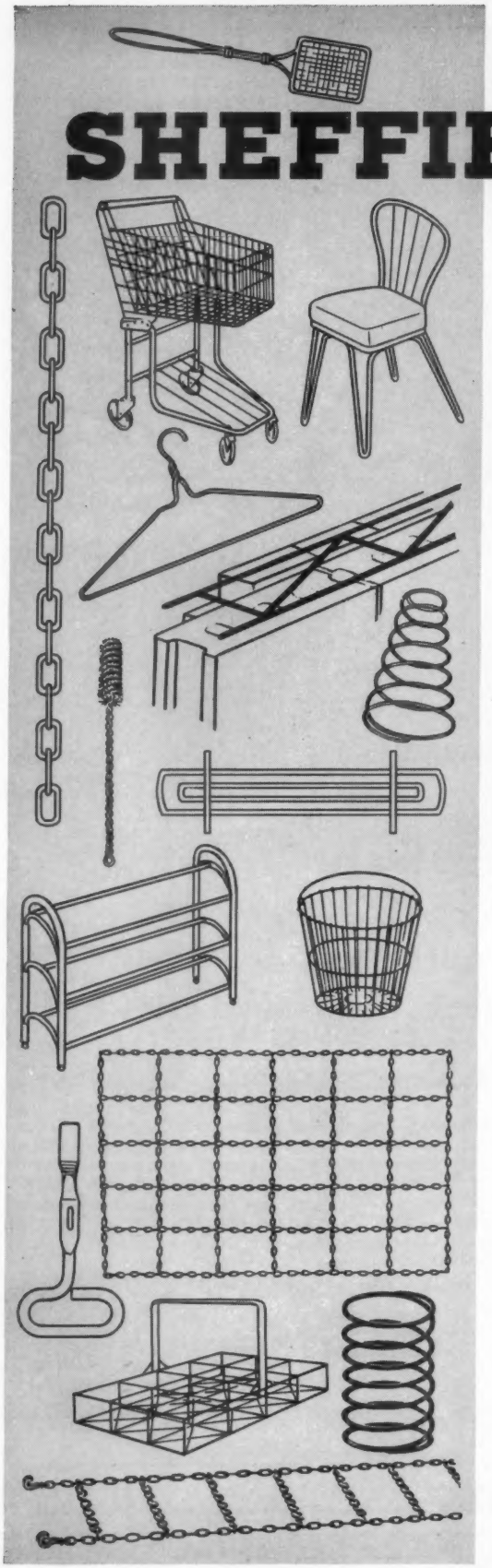
Application _____

Name _____ Title _____

Company _____

Address _____

City _____ State _____



*Why manufacturers use*

# SHEFFIELD WIRE

## *in more than 2,000 quality products*

Manufacturers and fabricators depend on Sheffield Wire for unvarying quality and accuracy in meeting their wire specifications. They are sure of getting the RIGHT wire—and getting it fast—because of Sheffield's advanced quality controls and strategic plant locations.

We're old hands at helping customers solve wire problems—with results that speed production, cut costs and improve products.

Let our metallurgists and wire specialists analyze your wire uses. We'll not only come up with the right wire for you, but also may be able to recommend more economical ordering units. This service is yours for the asking. Just call your nearest Sheffield office.

**SHEFFIELD KONE PAK***

gives you in one continuous spool the equivalent of 2 to 40 ordinary coils of wire. It gives longer continuous runs, less down time, and can cut scrap losses as much as 90%. The Kone Pak is mounted on a disposable wooden pallet, and can be packed in streamlined cardboard container if desired.

## SHEFFIELD ARMCO® WIRE PRODUCTS

**Coiled Wire**

**Annealed**—#20 (.035" ga.) through 1"

**Galvanized**—#20 (.035" ga.) through #4 (.225" ga.)

**Bright**—#20 (.035" ga.) through 1"

**Straightened and Cut Wire**

**Annealed**—#20 (.035" ga.) through ¾"

**Galvanized**—#20 (.035" ga.) through #4 (.225" ga.)

**Bright**—#16 (.0625" ga.) through ¾"

★ Patent Pending

**New ALUMINIZED WIRE**
16 ga. (.0625") through 6 ga. (.192")
**WRITE FOR FREE SAMPLE**

**SHEFFIELD DIVISION**
ARMCO STEEL CORPORATION
SHEFFIELD PLANTS: HOUSTON • KANSAS CITY • TULSA

# for electrical extrusion

## TRULON 500

(POLYVINYL CHLORIDE)

UL UNDERWRITERS' LABORATORIES

**APPROVED FOR FULL INTERCHANGEABILITY FOR WIRE and CABLE**

Trulon 500 has all the properties you look for in PVC resins

- FAST EXTRUSION RATES
- WORKS WELL IN A DRY BLEND OR PELLETS
- GEL FREE
- UNDERWRITER APPROVED FOR INTERCHANGEABILITY
- GLOSSY, SMOOTH FINISH
- UNIFORM QUALITY

*Long experience in wire insulation makes Trulon 500 a proven and tested product.*

We are manufacturers of an extensive line of Trulon PVC resins and Truflex plasticizers. Complete specifications and technical service available upon request. Write today.

THOMPSON CHEMICAL COMPANY

80 MENDON AVE., PAWTUCKET, RHODE ISLAND, U.S.A.

# PAYOFFPAK®

"pays off"

for wire converters

***TEN Labor Steps Cut To ONE***

Converting 500 pounds of steel wire requires 50 labor steps, according to a survey. That's using wire in old-fashioned coils. But the same job requires only *five* operations using wire in a Payoffpak fibre drum. That's saving work!

Production runs along more smoothly with Payoffpak, too. There are no turning reels to foul you up. No backlash! No overrun or inertia problems! No stops! Payoffpak dispenses a single, continuous strand of wire many miles long—up to 600 pounds of it—with only one threading operation.

Extra light weight keeps tare weight at a minimum with Payoffpak. Makes it easy to handle, too, with hand trucks.

Payoffpak saves you time, work, and money. So be sure the wire you buy is delivered in Payoffpak. It's better! It's by Continental.

TAILOR-MADE PACKAGE SERVICE

**CONTINENTAL CAN COMPANY**

**FIBRE DRUM & CORRUGATED BOX DIVISION**

**530 Fifth Avenue, New York 36, New York**

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## Air Diffusers by TITUS

## Music Wire by KEYSTONE

*deliver quiet air!*

Keystone Music Wire played an important part in the design and acceptance of these distinctive air diffusers produced by the Titus Manufacturing Corporation, Waterloo, Iowa.

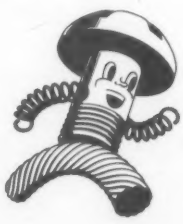
Behind their modern surface plate is a surprisingly intricate louver design. Individual baffles control the air flow, and each baffle is held securely in position by a loop of Keystone Music Wire. Formerly, these louvers were riveted in position—a costly, time-consuming and precision process, since the louvers had to be held tightly enough to avoid annoying rattles, yet loosely enough to be easily changed or adjusted.

Keystone Music Wire solved the problem. It improved the appearance of the product, reduced production costs and permitted the widest possible range of adjustment. Since then, Titus has standardized on Keystone.

Why? A company official puts it this way: "We can't afford to take a chance on anything else. The wire must be of a uniform, high quality . . . perfect in every respect. We have never had a complaint about our diffusers that could be directed to Keystone Wire!"

If you want to make a good product better, contact your Keystone Representative. He will gladly work with you to determine how Keystone Wire can help.

*Keystone Steel & Wire Company, Peoria 7, Illinois*



**KEYSTONE**

WIRE FOR INDUSTRY

# NOW! at low cost twist any number of conductors to make cable up to 1" diameter

only the COOK MULTIPLE INSULATED WIRE TWISTER provides such flexibility

Here's a twister that offers the flexibility required of todays wire mills manufacturing insulated cables. It's truly flexible —you can make any cables required up to 1" diameter.

And, because the COOK MULTIPLE INSULATED WIRE TWISTER is so low cost, it is the practical addition to your plant. Compare it with any other machine on the market doing this work . . . compare its performance . . . compare its cost . . . compare its construction. Why not see for yourself . . . write for complete specifications and prices today.

**SPECIFICATIONS**

| | |
|---|---|
| Production | 9,000 ft/hr at 7½" lay |
| Reel Size | 30" std. also from 16-36" dia. |
| Floor Space | 6 ft. x 8 ft. max. |
| Lay Range | ¾" to 7½" |
| Twist | Right or left hand |
| Finished Wire Size | Up to 1" dia. |
| Wrapping Head | Optional |
| Neutralizer | Optional |

COOK

MANUFACTURING CO.

50 EAST 25th STREET, PATERSON, N. J. • ARMORY 4-6380

•

*CANADIAN AGENT:*
E. V. LARSON CO., LTD., TORONTO, CANADA

•

*EUROPEAN AGENT:*
CAPAMADJIAN LE MONNIER CIE LTD., PARIS, FRANCE

**"Tough-to-make"**

**Cold-Headed Products like these . . .**

- Tubular Rivets (Punch Extruded).
- Non-threaded, multi-diameter, head and shoulder parts, drilled or not drilled.
- Washer and binding head screws with rolled threads.
- Special design fastenings and other small parts of intricate shape, with or without requirements for drilling or threading.

**. . . become "routine" with**

**SCOVILL**

EXTRUDED

# Cold-heading WIRE

(Cartridge Brass, 70%)

MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

## IT ELIMINATES

1. **OUT-OF-ROUND HEADS**
2. **INCOMPLETE FILLING-OUT OF HEADS AND SHOULDERS**
3. **ROUGH "ORANGE PEEL" EFFECT**
4. **UNSOUND HEADED PARTS**
5. **RED STREAKS AND STAINS**
6. **NON-UNIFORM FLOW**

**SCOVILL**

Send for new folder.

Scovill Cold-Heading Wire is extruded from CONTINUOUS-CAST brass billets by the hot extrusion process, then cold-drawn and annealed in accordance with closely controlled mill procedures.

CONTINUOUS CASTING produces *more uniform metal* than any other process, both in chemical composition and in freedom from casting flaws or other variations.

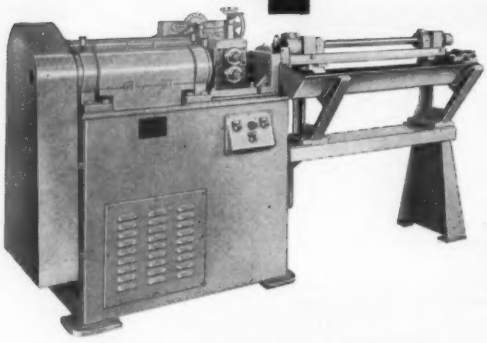
Scovill has standardized on *Cartridge Brass,* 70% for wire to be used in cold-heading operations. This alloy has a 5% HIGHER COPPER CONTENT than is generally found in brass cold-heading wire and is more ductile.

Prove this on your next wire order. Let us help you specify the proper closely controlled Scovill temper to produce more nearly perfect headed brass parts . . . whether you require "flow" characteristics for heading, or "flow" plus essential rigidity for secondary machining.

**SCOVILL MANUFACTURING COMPANY, Mill Products Division**

99 Mill Street, Waterbury 20, Connecticut. Phone PLaza 4-1171.

128C38



# *The RIGHT COMBINATION*

## for

# LOWEST COST

## Straightened and Cut Wire!

## Savings with a SHUSTER

*Above is the ALL NEW SHUSTER 2AV infinite variable speed, automatic Wire Straightening and Cutting Machine*

**wire size range:**
1/16" to 5/16" mild steel wire, 1/16" to 3/16" high tensile wire, 50 to 200 FPM.
Send for complete details today!

Let us prove that with your next 350 tons of wire up to 5/16" diameter. . . . a SHUSTER Wire Straightening and Cutting Machine *pays for itself!*

Send us your wire straightening requirements from .020" to $1\frac{1}{16}$" for quotation. Let us show you that a SHUSTER pays its way faster than any comparable machine!

Get the facts from one of our more than sixty representatives throughout the United States and Canada. There is one near you!

*Send for free, wall size split gauge wire chart from 41 gauge to 7/0.*

## METTLER MACHINE TOOL, INC.

155 W. Adeline, New Haven, Connecticut

20-YEAR RECORD REVEALS

# GREAT REDUCTION

IN CABLE SHIPPING COSTS

# EVANS LIGHT WEIGHT

## TOROIDAL METAL REELS

### 25% AVERAGE WEIGHT SAVINGS PER REEL

Toroidal design helps cut weight and freight costs to a minimum. Permits easier, faster, lower cost handling.

### OUTLASTS 5 WOOD REELS

Evans metal reels have a proven service life of 20 reel trips. Many thousands of these reels have *lasted over 50 trips.*

### CUTS MAINTENANCE COSTS

Cost records show Evans reels effect a 50% savings over wood . . . when Evans special repair kit is employed.

**For more complete information write to Chicago Sales Office: 208 South LaSalle Street.**

THE GEORGE EVANS CORPORATION

MOLINE, ILLINOIS

Crawford Door Company uses J&L superior quality, oil-tempered spring wire in 18 sizes for torsion and extension springs. Springs range from a few feet long to giants over 12 feet long, capable of raising 3,500-pound industrial doors without effort.

# "UNIFORM HEAT TREATING AND TEMPERING PAYS OFF IN SUPERIOR J&L SPRING WIRE"

## ...says Crawford Door Co. official

"J&L has a superior spring wire because of the control they are able to maintain in their heat treating and tempering operations," reports Mr. Jerome Fansler, vice-president of the Crawford Door Company, Detroit, Michigan.

"J&L spring wire is properly tempered. This means the wire will coil uniformly. There are no surface imperfections or potential breaking points."

Crawford Door uses J&L oil-tempered medium basic spring wire for torsion and extension springs. They buy 18 sizes, ranging from .192 (13/64") to .293 (19/64").

Every coil of J&L spring wire is thoroughly tested for uniformity of physical and dimensional properties. This uniformity can speed your production, reduce the number of rejects. J&L has complete control of wire quality from ore through finished product. When you specify J&L, you are sure of wire that is tops in quality yet competitive in price.

Next time you buy wire, call in your J&L representative for fast, satisfying service. Or write direct to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

J&L STEEL

**Jones & Laughlin Steel Corporation**

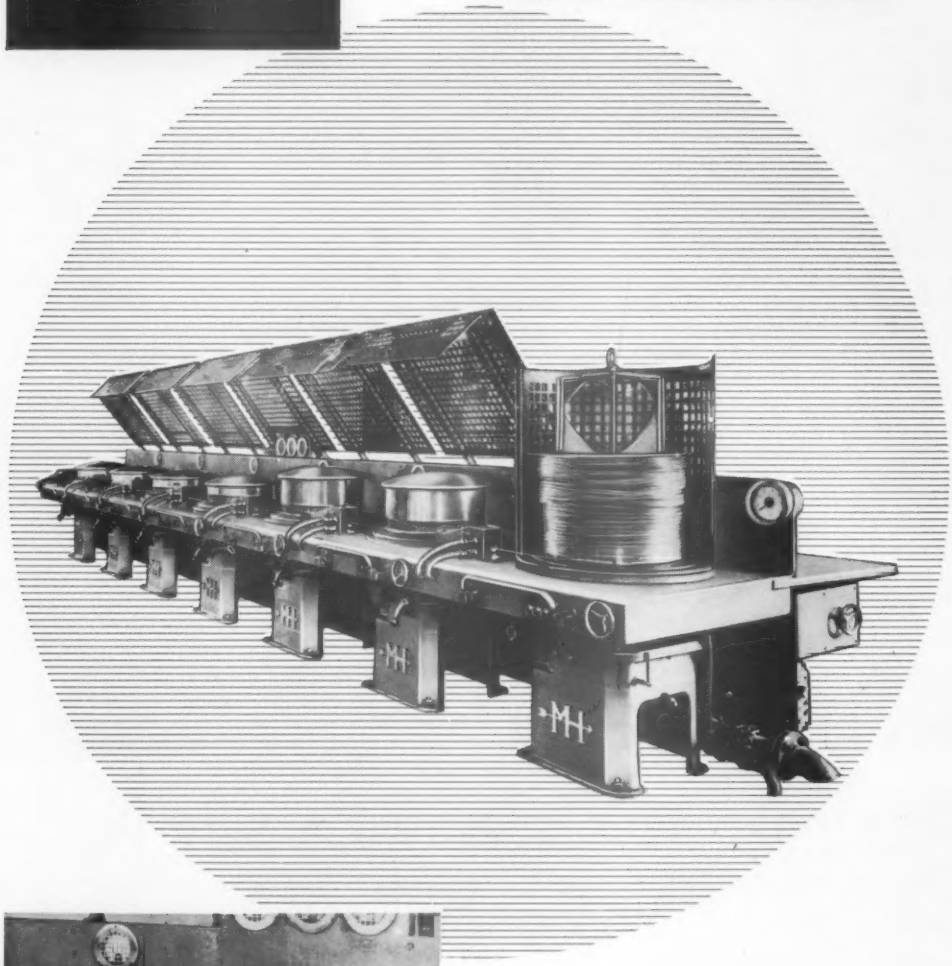
PITTSBURGH, PENNSYLVANIA

Three sizes for all types
of material
Optional number of blocks

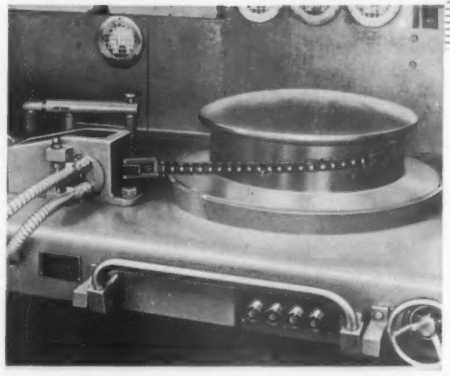
Our experience in building
wire drawing equipments
during 60 years
is your guarantee

# THE BEELINE

**Designed and built to meet today's requirements for trouble-free high production wire drawing**



*The medium size:*
*BEELINE DG 4 with*
*seven 24" blocks*



*Safe pulling-in at slow speed*

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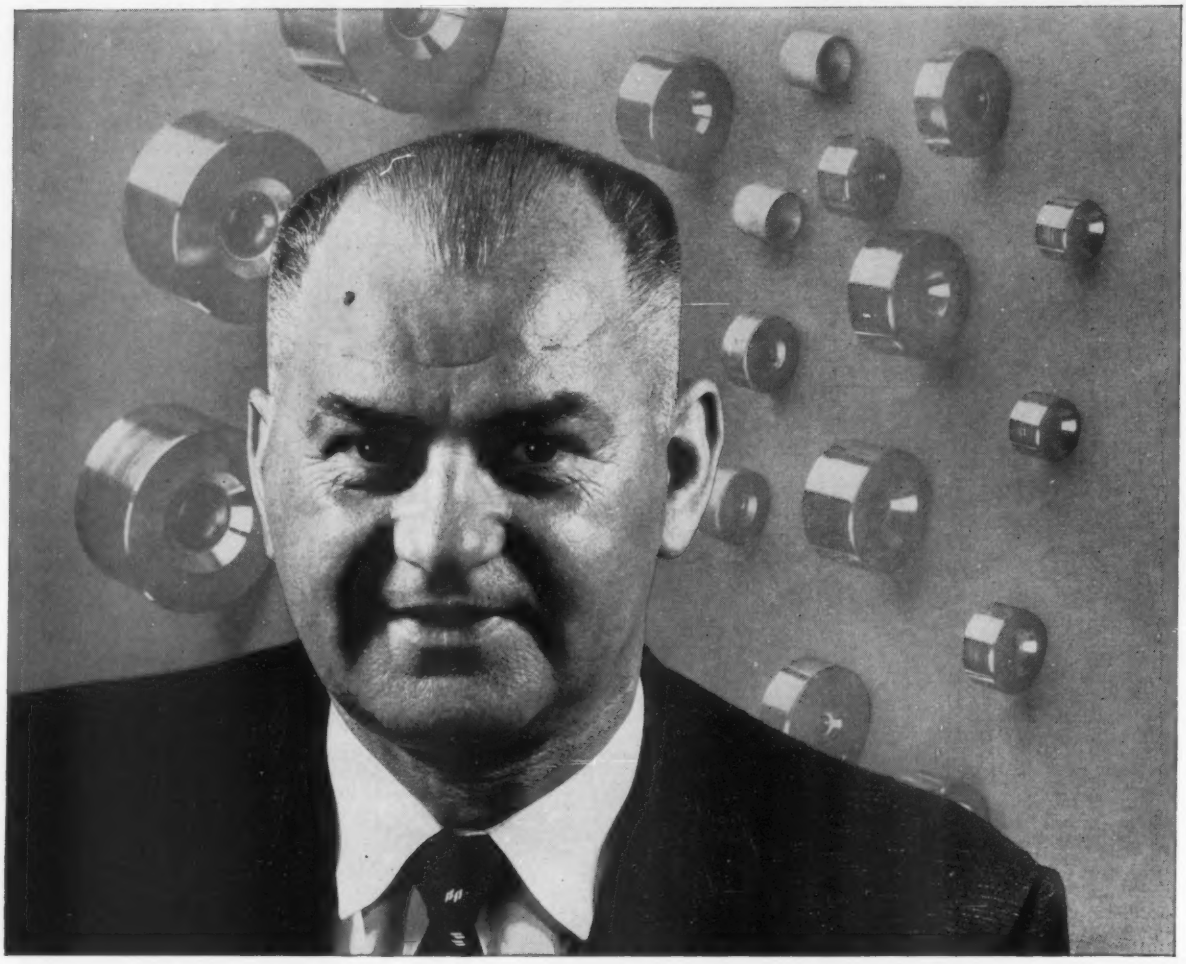
Cable: Morgårdshammar, Ludvika. Telephone 0240-71100.
U S office: 19002 Lomond Boulevard Cleveland 22, Ohio.

# *Firth Sterling* . . .

*PIONEER IN POWDER AND MOLTEN METALLURGY*



## Picture of the "Plus Value" in Firthaloy Dies

Chances are you've recognized **Eddie Miller's** picture above. There's also a good chance that he's helped you—with plant layout, purchase of equipment, die design, or in a dozen other ways—just as he's helped so many others during the past quarter of a century. That's why he and his staff have become a symbol of the "plus value" you get in Firthaloy Carbide Dies.

This unequalled knowledge and experience is yours for the asking. When you add this "plus value" to the recognized superiority of Firthaloy Carbide Dies for longer wear, better finish, and lower costs, you have a combination that can't be beat.

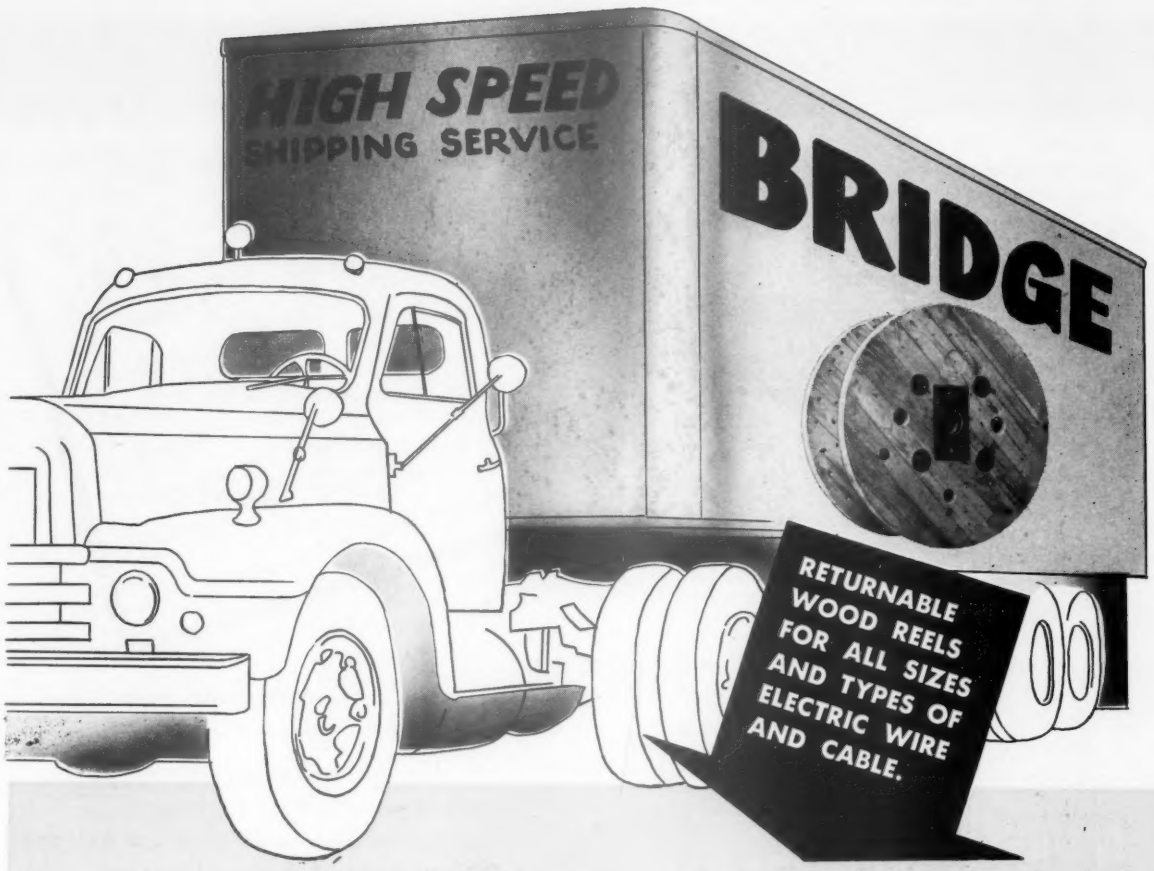
To add Eddie Miller to your staff, but not to your payroll, write: Eddie Miller, Firth Sterling, Inc., 3113 Forbes Avenue, Pittsburgh 30, Pa. Offices and warehouses in principal cities.

*"Your Future is Great in a Growing America"*

PRODUCTS OF *Firth Sterling* METALLURGY

HIGH SPEED STEELS • TOOL & DIE STEELS • STAINLESS SPECIALTIES • HIGH TEMPERATURE ALLOYS
SINTERED TUNGSTEN CARBIDES • HEAVY METAL • CERMETS • CHROMIUM CARBIDES
ZIRCONIUM • STERVAC & STERCON SUPER ALLOYS

FIRTH STERLING TRADE MARK

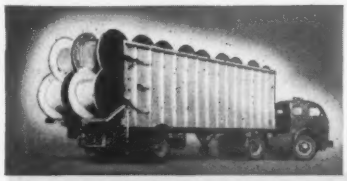



# EVERY TYPE OF WOOD REEL—

**Returnable or Non-Returnable for the WIRE INDUSTRY . . . from 10" to 10' in diameter.**

**STRAIGHT LINE production methods produce accurately-made REELS of HIGHEST QUALITY at prices that make it good business to buy from BRIDGE.**

**A completely MODERN plant, with the very FINEST and FASTEST equipment, much of it specially designed for BRIDGE, assures you of rapid SERVICE and STRONG SERVICEABLE REELS.**



**HIGH SPEED**
**SHIPPING SERVICE IN OUR OWN TRUCKS**

within a radius of 200 miles from the plant. Fast freight will bring you Bridge reels within a few days east of the Mississippi.

RETURNABLE REELS ARE BUILT TO PROVIDE MANY TRIPS WITHOUT REPAIRS.

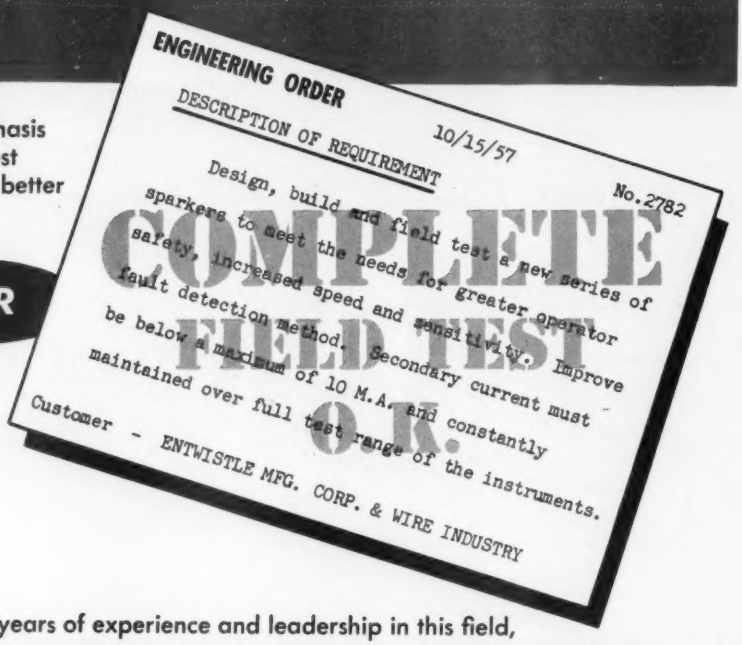
**"REEL GOOD . . .**

Let us quote on your reel needs. Send us your specifications. Better yet, visit our plant and see how and why Bridge reels are made so well at so low a cost.

**WOOD REELS"**

Our awareness to the increasing emphasis being attached to the modern sparktest operation, and the industry's need for better than best, has spurred Entwistle Manufacturing Corporation to issue this

**ORDER**


ENGINEERING ORDER
DESCRIPTION OF REQUIREMENT
10/15/57
No.2782
Design, build and field test a new series of sparkers to meet the needs for greater operator safety, increased speed and sensitivity. Improve fault detection method. Secondary current must be below a maximum of 10 M.A. and constantly maintained over full test range of the instruments.
Customer - ENTWISTLE MFG. CORP. & WIRE INDUSTRY
COMPLETE
FIELD TEST
O.K.

**ACTION**

Utilizing our 40 years of experience and leadership in this field, Entwistle Manufacturing Corporation's engineers have created new concepts in sparkers and have improved existing models.

Our engineering answer now makes it possible for us to offer you choices from eight separate classes encompassing 30 different models of A.C. and D.C. spark testers that are, not only new, but completely field-tested and proven.

**ACHIEVEMENT**

1. New adjustable high sensitivity, high speed electronic fault detectors guarantee detection of all faults.
2. New monitor circuits assure the operator of proper functioning of electronic detector.
3. New low secondary fault currents as low as 6 M.A. assures safety of your operator and minimizes insulation damage at detection of fault.

**CONCLUSION**

These being but a few of the new features which make Entwistle Manufacturing Corporation Sparkers the safest, most reliable and versatile ever produced, we suggest that:

**YOU** *have the problems . . .* **OUR** *Sparkers are the solution . . .*

*WRITE FOR DETAILS.*

**ENTWISTLE**
**Manufacturing Corporation**

1475 ELMWOOD AVE., PROVIDENCE 7, RHODE ISLAND
*Over 40 years of dependable service to the Wire Industry*

**BRITISH ASSOCIATES** THE KEMSON ENGINEERING CO. LTD.
WELLINGTON MILL. BOLTON ROAD · BLACKBURN

# NATIONAL

## automatic welding unit

## produces up to 231 sq. ft. wire mesh per minute

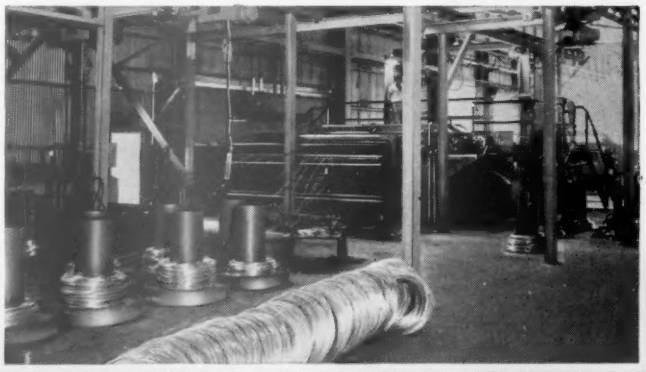
## .....*automatically*

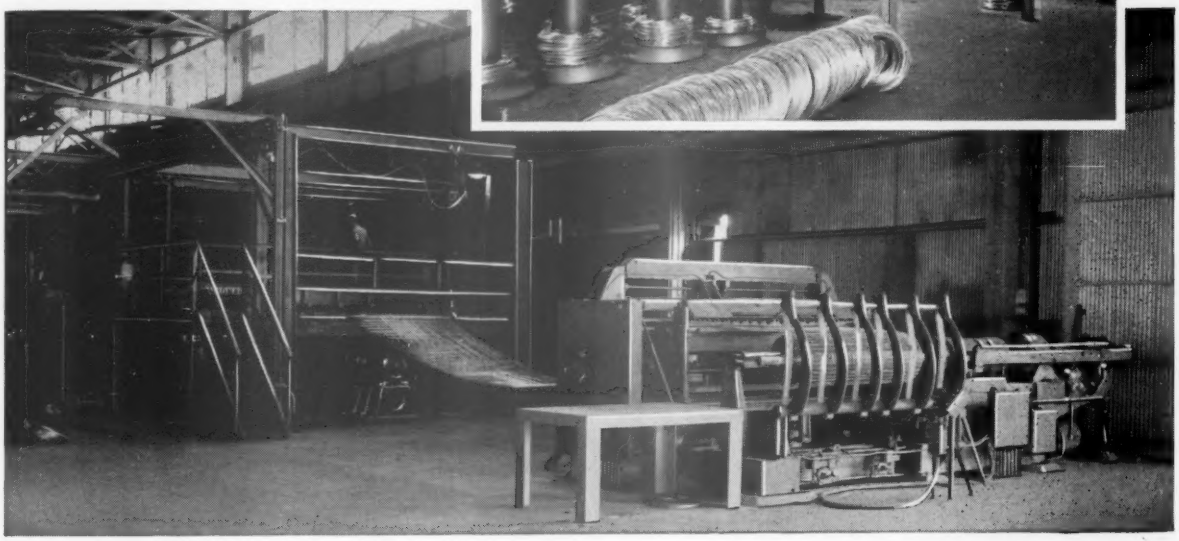
Developed specifically to produce wire mesh in a variety of sizes at high speed . . . this one National Electric Welding Unit drastically cuts manufacturing costs. All operations . . . wire straightening . . . feeding . . . welding . . . rolling . . . and cutting . . . takes place automatically with this one machine.

Highly versatile, this fabric welder produces mesh 8′-3″ wide in all wire sizes from #10 gauge (.135 maximum) to #16 (.0625 minimum). The unit may be set up for longitudinal spacing from a one inch minimum to any desired maximum in one inch increments. Cross wire spacing is ½ inch minimum to 8 inch maximum in any desired dimension.

The unit consists of a longitudinal wire straightener and base assembly; dual automatic cross wire feeds; welding unit; mat puller and indexing unit; and cut-off stand and coiler. The cut-off stand incorporates a traveling carriage mounted motor-driven saw which travels across the mat during cutting.

The wire fabric, produced at such an amazing rate by this welder, is used for fencing, corn cribs, turkey pens, poultry yards, etc. But, no matter what type of volume welding job you do . . . it can be done quickly and economically with a National Electric Welding Machine designed to suit your individual application. Write for full information.





53

**NATIONAL ELECTRIC WELDING MACHINES CO.**

1880 N. TRUMBULL STREET • BAY CITY, MICHIGAN

25 YEARS EXPERIENCE DESIGNING AND BUILDING: SPECIAL & STANDARD • AIR • HYDRAULIC • MOTOR DRIVEN • SPOT • PROJECTION • SEAM • BUTT • FLASH • RESISTANCE WELDERS • PRODUCTION FIXTURES FOR ALL TYPES OF AUTOMATIC ARC WELDING

*Announcing the . . .*

# ANNUAL CONVENTION
## OF
# THE WIRE ASSOCIATION

***The Dates:*** **October 13—16, 1958**

***The Place:*** **Chalfonte - Haddon Hall Hotel, Atlantic City, N. J.**

***The Program Committee***

***General Program Chairman***

Raymond S. Worth, Mfg. Mgr., Wire Mills Div.
John A. Roebling's Sons Corp., Trenton, N. J.

***Ferrous Program Chairman***

Dartrey Lewis, Chief Eng., Res. & Dev.
John A. Roebling's Sons Corp.
Trenton, N. J.

***Non-Ferrous Program Chairman***

Hugo W. Biskeborn
Torrance, California

***Co-Chairman***

Clement C. Lawson, Plant Facilities Engineer
Bell Telephone Company Laboratories
Murray Hill, New Jersey

***The Program***

For the Ferrous Division, seventeen technical papers have been secured, covering various phases of steel wire processing and manufacturing operations.

The Non-Ferrous Division presently has concluded arrangements for sixteen papers covering production problems in connection with bare and insulated power conductors and communication wire and cable. This will include many more papers of interest to electric wire and cable men than have been presented at any previous convention.

Plant visits to Roebling's steel wire plant in Roebling, N. J., and to Roebling's electric wire and cable plants in Trenton, N. J.

**Many other program features will make the 1958 Convention the most important one yet held. Full details will be published at a later date.**

***Meanwhile, make your plans to attend.***

***Reservation cards available upon request.***

# THE WIRE ASSOCIATION

**RICHARD E. BROWN, *Executive Secretary***

**453 MAIN STREET** **STAMFORD, CONN.**

# NOW FOR HIGHER PRODUCTION

HIGH SPEED TAPING MACHINE WITH UP TO 1800 RPM FLYER SPEED. 1 TO 4 TAPES PER STATION. PAPER PADS 10½". MAXIMUM WIDTH OF WIRE 13/16 OF AN INCH. PRODUCTION SPEEDS AS HIGH AS 200 FT. PER MINUTE HAVE BEEN OBTAINED.

EST. 1855 AIMCO INC. 1915
"American" INSULATING MACHINERY COMPANY
TRADE MARK
FAIRHILL AND HUNTINGDON STREETS
PHILADELPHIA 33 PENNSYLVANIA U.S.A.
ENAMELING-TAPING INSULATING-SPOOLING AND ALLIED MACHINERY

**A** Complete 3-station taping machine

**B** Taping flyer showing 1 tape

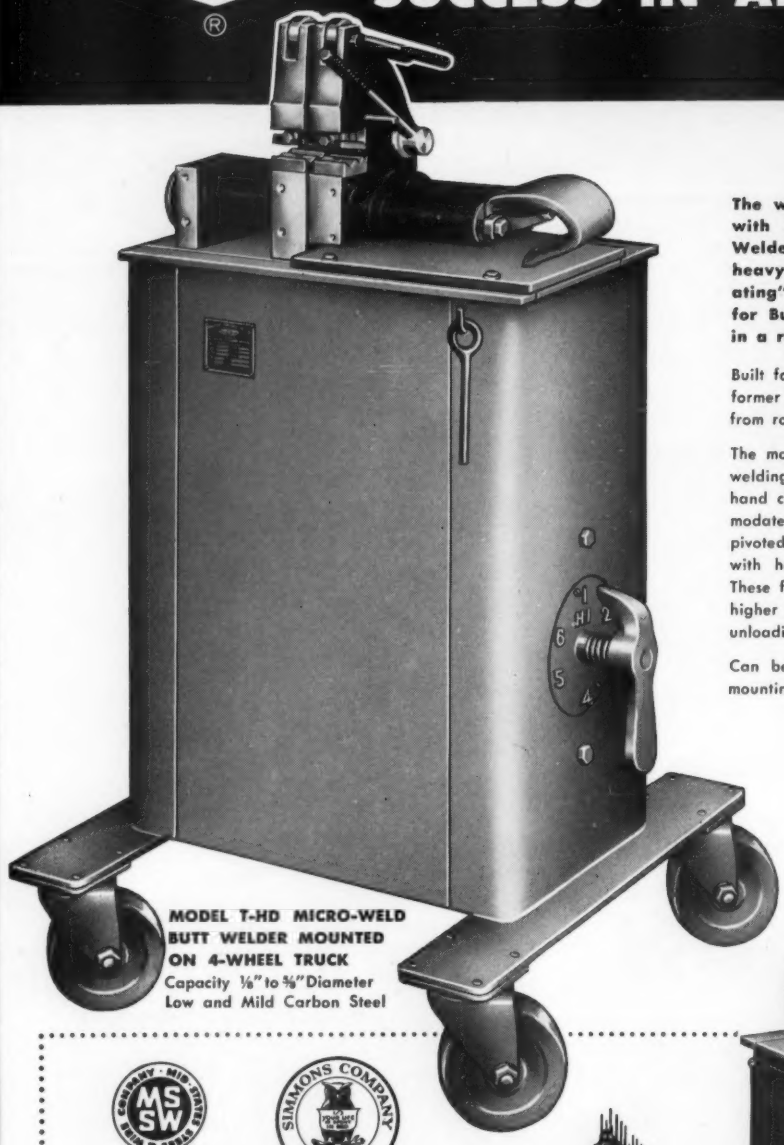
**C** Taping flyer showing 2 tapes

**D** Taping flyer showing 4 tapes

**AMERICAN INSULATING MACHINERY COMPANY**
FAIRHILL AND HUNTINGDON STREETS PHILADELPHIA 33, PENNSYLVANIA, U.S.A.

MICROMETER PRECISION MICRO-WELD ®

# CO-OPERATION . . . THE KEY TO SUCCESS IN ANY FIELD!



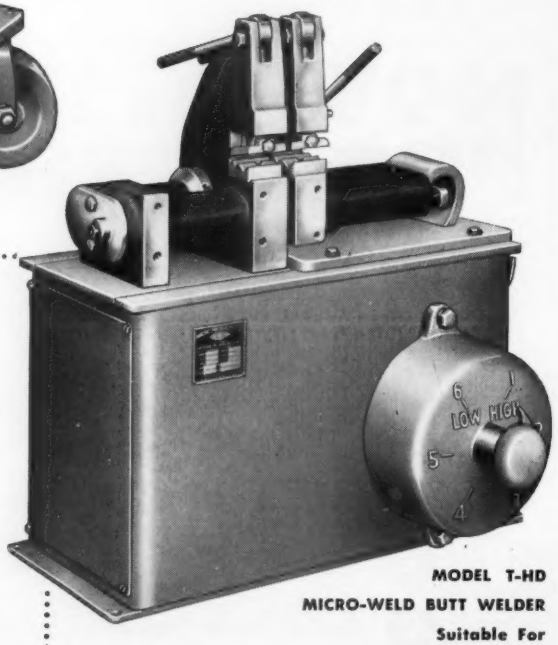
**MODEL T-HD MICRO-WELD BUTT WELDER MOUNTED ON 4-WHEEL TRUCK**
Capacity ⅛" to ⅝" Diameter
Low and Mild Carbon Steel

**The wire industry of the American hemisphere co-operating with MICRO PRODUCTS COMPANY developed efficient Butt Welders for the world of wire . . . Model T-HD MICRO-WELD heavy duty Butt Welder has proven it's worth in "co-operating" with cold heading equipment, and other requirements for Butt Welding low and mild carbon steel wire and rods in a range of ⅛" to ⅝" diameter.**

Built for heavy duty service, headpieces are made from bronze, transformer housing and truck are combined into a substantial unit, fabricated from rolled steel plates and arc welded.

The model T-HD MICRO WELD Butt Welder is a general purpose butt welding machine, equipped with manual spacing mechanism, individual hand clamps, manual spring upset mechanism, welding dies to accommodate the full range of sizes without changing dies, self-equalizing pivoted clamping shoes operated through simple positive cam clamps with heavy inserted coil springs to compensate for size variations. These features together with conveniently located controls contribute to higher production with a minimum of time required for loading and unloading.

Can be supplied mounted on 4-caster wheels or suitable for bench mounting.




**MODEL T-HD MICRO-WELD BUTT WELDER Suitable For Bench Mounting**

MS SW — MID-STATES STEEL & WIRE COMPANY

SIMMONS COMPANY

ACCO — TRADE MARK

CONTINENTAL STEEL

LACLEDE

STELCO

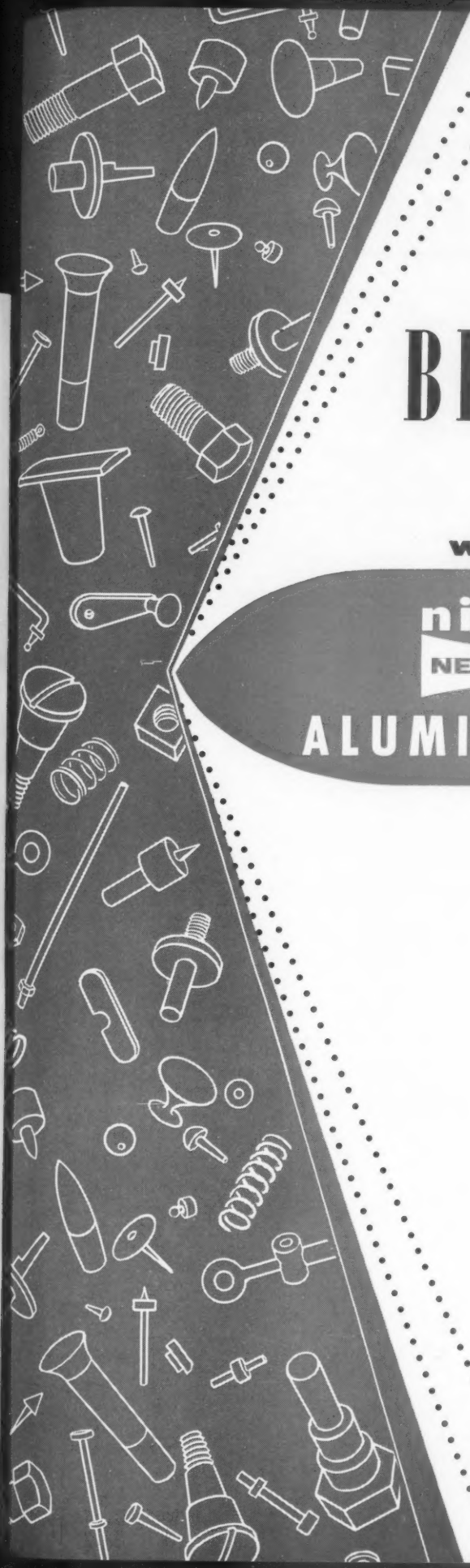
CF&I

These are some of the users of model T-HD MICRO-WELD Butt Welders.

MICROMETER PRECISION MICRO-WELD ®

## MICRO PRODUCTS COMPANY

**20 NORTH WACKER DRIVE • CHICAGO 6, ILLINOIS • TELEPHONE STate 2-7468**



# BREAKTHROUGH!

with

**nichols**
**NEVER-STAIN**®
**ALUMINUM WIRE**

ALUMINUM WIRE PRODUCTS.
The pioneering in this expanding field has been done. Now it's your wide-open opportunity to move in! And Nichols, through its sustained research and development program, has the material and technical resources you need to stake your claim on this fabrication frontier.

Check with us now for aluminum wire made to your exact specifications.

**nichols**
**WIRE & ALUMINUM CO.**
**DAVENPORT, IOWA**

U.S.I.

Vol. III No. 1

# POLYETHYLENE PROCESSING TIPS

## PROCESSING CONDITIONS AFFECT STRESS-CRACK RESISTANCE OF POLYETHYLENE PRODUCTS

Most thermoplastic materials are subject in varying degrees to environmental stress-cracking . . . and polyethylene is no exception. Stress-crack failures may occur in polyethylene when the plastic is under high local stresses, either externally or internally applied, and in contact with soap, detergent or solvent.

Stress crack resistance depends on the resin used, and the processing conditions. The effect of polyethylene resin properties were discussed in the last issue of TIPS. This issue will be devoted to the effect of processing conditions.

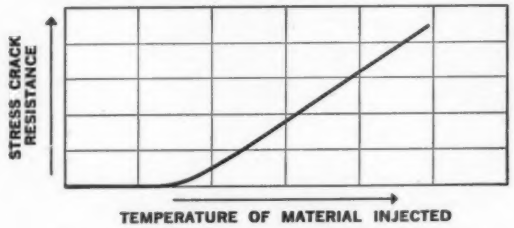
Apart from outside forces, there are, for a given polyethylene resin, two main causes of stress-cracking: locked-in stresses, and a high degree of molecular orientation. Locked-in stresses arise from uneven shrinkage during cooling. In molecular orientation, polyethylene molecules are comparable to iron filings in a magnetic field; they line up in force or stress patterns which, in effect, are stress concentrations along which fractures may occur.

### Mold design affects stress cracking

To improve the stress-crack resistance of molded polyethylene, the molder should select his resin carefully on the basis of mold design, injection and mold temperatures, and, of course, the properties he wants in his end product.

Here, for example, is one way in which mold design can influence the choice of a resin: It is *generally* true that resins of higher molecular weight have relatively high stress-crack resistance. But in deep-draw molded items, or those with large cross-sections, resins of low molecular weight often yield a product with better stress-crack properties. This is because resins of low molecular weight—and hence, lower viscosity—permit the mold to fill more quickly. Under these conditions the material cools at a more uniform rate and fewer internal stresses are created.

Different flow rates, due to abrupt changes in mold cross-section or to sharp corners, may create points of stress concentration. These cannot always be eliminated, since every design is a compromise between mold engineering and product design.

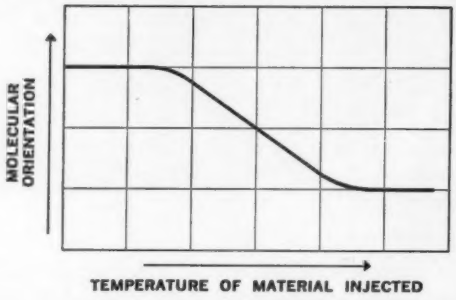



Stress crack resistance increases with higher stock temperatures in injection molding.

### How Cold the Mold?

Higher production rates, made possible by running a cold mold, may be offset by a high incidence of stress-crack failures due to molecular orientation. This difficulty may be minimized by using a resin with the right flow properties—always bearing in mind that a practical compromise must be made with other desired end properties. Molecular orientation occurs when the hot resin comes in contact with the relatively cool walls of the mold. The outer surface of the stream cools faster than the interior and tends to slow down, while the material nearer the center flows unimpeded. The molecules tend to line up in the direction of flow.

This difference in cooling rates between the material at the periphery of the stream and its center also sets up internal stresses which induce stress-crack failures.




Molecular orientation is decreased with higher stock temperatures.

### Mold Release Agents have some effect

Mold release agents may be of some benefit, as they tend to reduce the "drag" effect. However, caution must be used in their selection, since certain materials may induce stress cracking.

### Compromise is often necessary

While no simple answer exists to the problem of stress-cracking in polyethylene products, resistance can usually be brought to a satisfactory level by choosing the best resin, making adjustments in molding temperatures, cooling rates and mold design. Since certain compromises must always be made, in selecting a resin and in processing techniques, processors can frequently use the services of a resin specialist. U.S.I.'s Technical Service Engineers are ready to discuss your processing problems, and to help in every way to solve them.

U.S.I. INDUSTRIAL CHEMICALS CO.
Division of National Distillers and Chemical Corp.
99 Park Ave., New York 16, N.Y.
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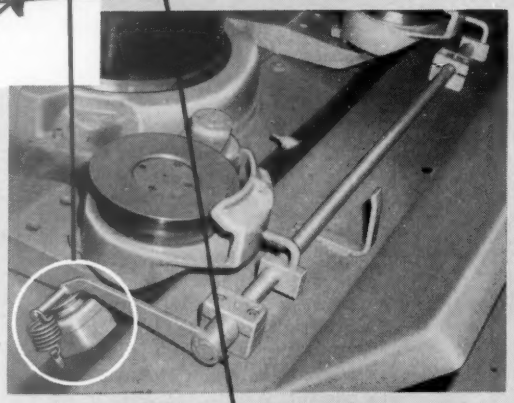
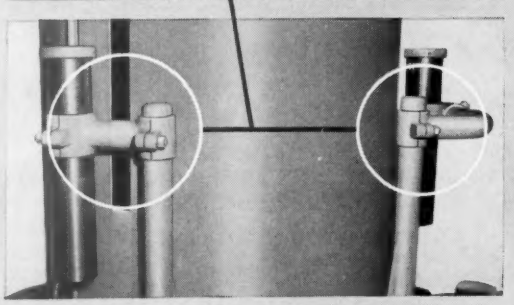
# HOW SAFETY matches SPEED IN Vaughn® WIRE DRAWING EQUIPMENT

NOTE THESE built-in features
SACK GUARD—protects operator on adjacent machines
ADJUSTABLE ELECTRIC EYE—for full bundle stop
EXTRA-HIGH FINISHING BLOCK GUARD—for large bundles on riding block stripping spiders
BROKEN WIRE SWITCH—for instant shut-down if break occurs
PINTLE SAFETY HOLD-DOWN—prevents riding stripper from being forced up by wire being coiled
FRONT SAFETY GUARD—stops machine if pushed. Machine will operate only at inching speeds if guard is lowered
BLOCK GUARD SAFETY SWITCH—stops operation when guard is opened
VAUGHN





**SAFETY** for men and equipment is engineered thoroughly into Vaughn Wire Drawing Machinery—in every type, in every model. The high operating speeds of modern Vaughn machines are *safe* speeds because of this engineering. Our Motoblox, Motoblocs, Ringblox and other equipment are designed to match *productivity with protection* over the widest range. Let us detail our many safety developments, at your convenience.

*"Quick on the Draw!"*

**The VAUGHN MACHINERY COMPANY**
**CUYAHOGA FALLS, OHIO**

**COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.**

**WORKING WONDERS WITH WIRE:** at Pittsburgh's Steel Company Monessen (Pa.) Fabric Dept.

# Northern Indiana Steel's *rugged, new, operation-proved* WIRE CARRIERS and PAY-OFF REELS

**PITTSBURGH STEEL'S $111,000,000 EXPANSION PROGRAM** called for a new 125-ton 96-inch wire fabric machine, among many other improvements. To feed this monster, Pittsburgh's Monessen (Pa.) Works makes efficient use of 45 advance-design Northern Indiana Steel Supply Company Wire Carriers and Pay-Off Reels.

**SAYS SID JOHNSON, FABRIC DEPT. SUPER:**

"Because these wire carriers can safely carry up to 4,000 pounds—depending on the gauge and footage of wire—they help us reduce downtime on this new machine. We now need to weld new reels of wire only every 16 hours, the equivalent of two working turns."

In addition, 500 other Northern Indiana wire carriers have been found ideal by Pittsburgh for *storing* wire. The carriers are easily stacked, leaving maximum use of floor area. Result: good housekeeping with minimum effort.

**DESIGNED AND PRODUCED TO YOUR SPECIFICATIONS**

**Wire Carriers and Reels that**

- ✓ **FEED MORE SMOOTHLY**
- ✓ **CARRY UP TO 4,000 LBS.**
- ✓ **STACK AND STORE EASILY**

Let us know exactly what your operating needs require. If we don't already have it in stock, we're ready to make up your order as per your specifications. In any case, we'll be pleased to quote you promptly in quantities specified.

## NORTHERN INDIANA STEEL SUPPLY CO., INC.

Fabricating Division, Michigan City, Indiana

TELEPHONE TRiangle 4-3241

## *Roebling Tire Bead Wire: Packaged for Maximum Benefit*

The problems eliminated by this unique reel-less core packaging system are manifold. Loads are palletized two cores per pallet and may be stacked two or three high. This, plus the fact that you need not accumulate empty reels means storage space requirements are cut to *less than half*. You do away with all freight and handling costs on reels, the bother and expense of "bookkeeping" returnable reels, and the freezing of money in reel deposits.

This is typical of Roebling's advanced packaging methods—that makes handling Roebling high-quality wire so much easier. For details on this efficient Roebling Tire Bead Wire packaging method, or information on other types of Roebling wire, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

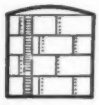
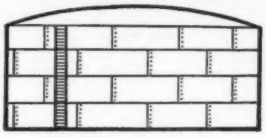
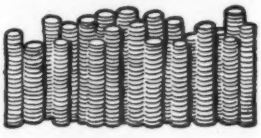
**ROEBLING**

*Branch Offices in Principal Cities*
*Subsidiary of The Colorado Fuel and Iron Corporation*

# WANT TO CUT PICKLING COSTS?

## YOU CAN WITH **ACP RODINE**

Even though you are now using an inhibitor in your pickling bath, highly concentrated ACP RODINE can cut pickling costs. Savings in acid, steel and money, as shown in the chart, are based on: a monthly steel production of 15,000 tons; a selling price of $140.00 a ton; and an acid cost of $ .01 a pound.

| | | | |
|---|---|---|---|
| **ACID SAVED** | 3 lb. per ton |  45,000 lb. per month |  540,000 lb. per year |
| **STEEL SAVED** | 1½ lb. per ton | 22,500 lb. per month | 270,000 lb. per year |
| **DOLLARS SAVED** | $.135 per ton | $2,025.00 per month |  $24,300.00 per year |

For complete information about ACP RODINE and the savings it makes possible, write us at our Ambler offices. It will mean no obligation whatsoever.

RODINE is a registered trademark of Amchem Products, Inc.

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*New Chemical Horizons for Industry and Agriculture*

# SWIFT'S FLEXAL 2

THIS "LIGHT" METALLIC STEARATE WAS THE

MISSING LINK IN AN IMPORTANT DEVELOPMENT

## Your process might be the next to benefit

Until recently, Flexal² was the elusive *missing link* in a Swift research program aimed at the development of a superior and highly heat resistant, water insoluble, metal processing lubricant.

Flexal² is a "light" metallic powder of extremely uniform consistency. It has exhibited excellent heat stability and has shown long, effective and *economical* service life as an anti-friction agent for the processing of ferrous metals.

Swift's success with this program has revealed a *variety* of usages for Flexal² which has led to the development of a whole *family* of Flexals. The properties offered by this new family of products will be of interest to anyone seeking a: *process lubricant; parting agent; high speed and/or anti-friction compound . . . and many others.*

The Flexals are available in production quantities or on sample or trial order. The benefit of Swift's technical experience with these remarkable products is available to help you. Just return the coupon for details.

*To Serve Your Industry Better* **Swift** 103RD YEAR

**FREDDIE FLEXAL** *invites your further inquiry.*

SWIFT & COMPANY, Industrial Soap Dept. S-44W
4115 Packers Ave., Chicago 9, Illinois

How can we place a trial order or obtain a sample of Swift's Flexal?

(Please describe intended usage briefly).....

.....

Company.....

Address.....

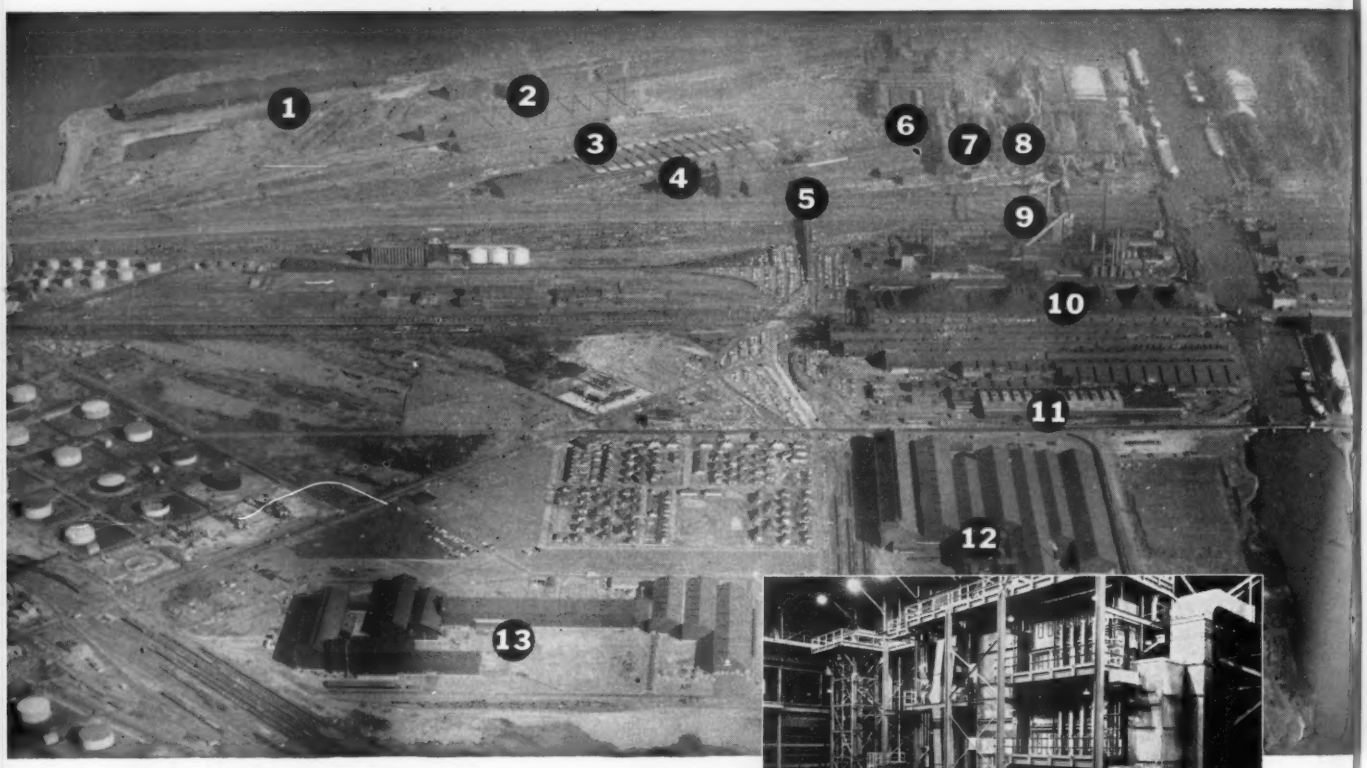
City.....Zone....State.....

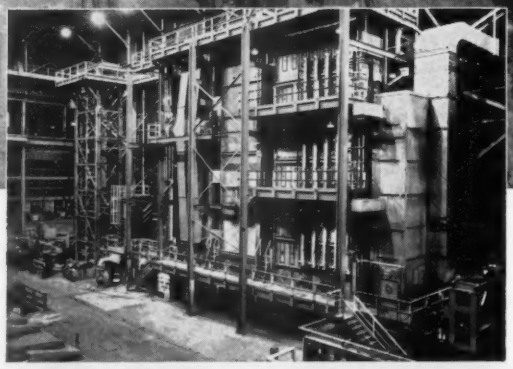
Your Name & Position.....

# Birdseye view of the future...

**Youngstown's Expansion Program provides more quality steel for Mid-America**

The hustle, the feel of the future and the booming spirit of expansion . . . this is the spirit of Youngstown. The birdseye view shows our Indiana Harbor facilities where we are putting this spirit to work in the Chicago area. In addition to our No. 2 Blooming Mill (2), No. 2 Open Hearth Shop (3), Merchant Mill (4), No. 1 Open Hearth Shop (5), Billet and Skelp Mill (6), Continuous Weld Pipe Mills (7), Blast Furnaces (8), Coke Plant (10), Strip and No. 1 Tin Mills (11), the Cold Reduced Sheet Mill (12) . . . our new No. 3 Seamless Tube Mill (1), our new (9) Sintering Plant (construction began in March 1958) and our new No. 2 Tin Mill (13) are shown. These last three expansions are pointed directly at the growing markets of the Mid-Continent. Like the pioneers who made America the great nation it is, Youngstown moves toward new horizons . . . new ways to supply your steel needs through quality products and friendly, efficient service!



*Huge new Continuous Annealing Line in our No. 2 Tin Plate Mill, Indiana Harbor Plant.*

*The world's largest Rotary Billet-Heating Furnace in our No. 3 Seamless Tube Mill, Indiana Harbor Plant.*

QUALITY YOUNGSTOWN SERVICE

THE
**YOUNGSTOWN**
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*Manufacturers of Carbon, Alloy and Yoloy Steel, Youngstown, Ohio*

PLANTS AT YOUNGSTOWN, OHIO AND INDIANA HARBOR, INDIANA

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**SPECIALLY-PROCESSED BUTADIENE-STYRENE POLYMERS**

## dry!

## ...like the Moon

The Moon is dry because it has no atmosphere. NAUGAPOL® polymers are dry–*and stay dry*–because they are free of moisture-absorbing salts.

*Special processing* does it...special processing that eliminates use of salts as the coagulant. Whatever grade you require–1016, 1018*, 1019*, 1021, 1022*, 1023, 1503* or 1504*–the name NAUGAPOL is your assurance of–

- **HIGH DIELECTRIC PROPERTIES**
- **LOW MOISTURE ABSORPTION**
- **LOW ASH CONTENT**

These are the qualities that make NAUGAPOL Polymers ideal for use in electrical wire and cable insulation and in mechanical rubber products requiring good flexibility at sub-freezing temperatures. If *you* require *special properties* in synthetic rubber, come to Naugatuck!

*Light-colored polymers stabilized with non-discoloring, non-staining POLYGARD®

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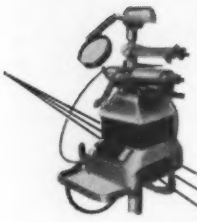
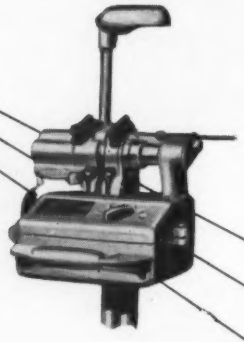
# SCHLATTER

**BUTT WELDERS are universally used throughout the wire industry.**

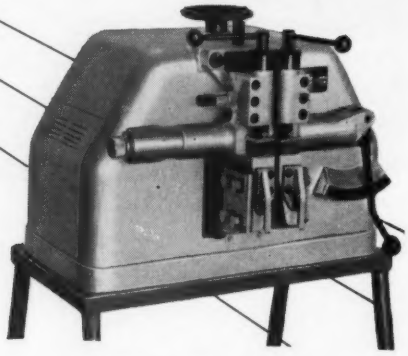
**SCHLATTER welders are available with special control equipment to weld high carbon steel.**



**MODEL "S", for**
**Steel: .001" - .08" diam.**
**Copper: .0011" - .072" diam.**



**MODEL "E", for**
**Steel: .04" - .32" diam.**
**Copper: .04" - .25" diam.**



**MODEL "M", for**
**Steel: .16" - .51" diam.**
**Copper: .16" - .37" diam.**

***Our range includes:***

**Butt**
**Spot and**
**Seam Welders**
**Spot and Butt Welding Automatics**
**Special Purpose Welders**
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***You are cordially invited to submit inquiries on your welding problems or for equipment.***

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***Manufacturers of Electric Welding Equipment and Electronic Controls***

**Representative for Canada and the U.S.A.:**

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(COLD ROLLED)
WIRE
...Ferrous or Non-ferrous,
in Coils or Straight Lengths
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• Square Edge Flat Wire
• Keystone Shaped Wire
• Oval Wire
• Half Oval Wire
• Half Round Wire
• Special Shaped Wire
• Spring Washers
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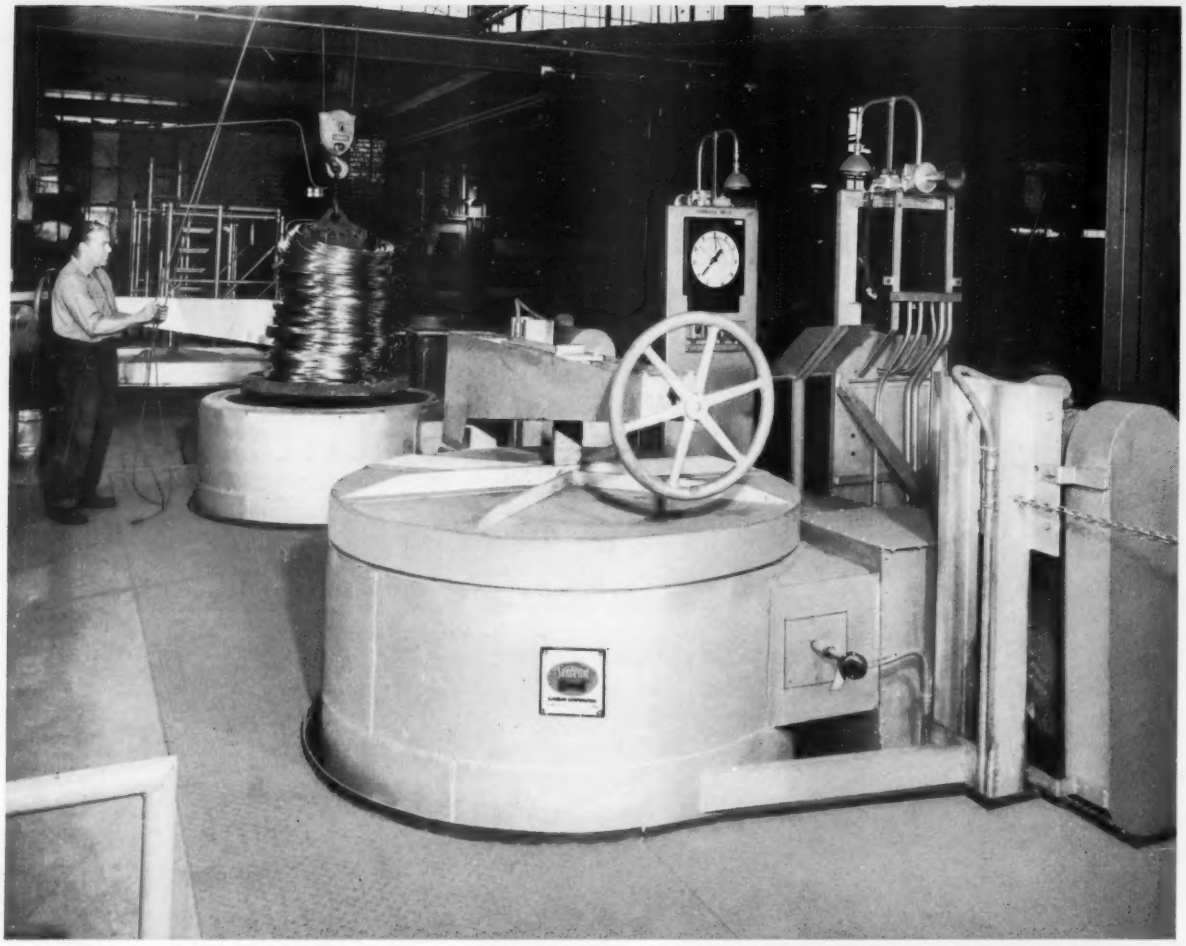
Complete Metallurgical Service
The NATIONAL
LOCK WASHER COMPANY
Precision Shaped Wire Division
NEWARK 5, NEW JERSEY
MILWAUKEE 2, WISCONSIN
NLW



Sunbeam Stewart pit type furnaces at Chicago Extruded Metals Co., Cicero, Ill.

# WIRE PROCESSING FURNACES BY SUNBEAM STEWART

## The Best Industrial Furnaces Made

Sunbeam Stewart equipment for the metals industry includes complete wire and strip furnace installations . . . batch or continuous —for ferrous and non-ferrous metals. All auxiliary equipment including heat treatment, cleaning, cooling, atmosphere generators, instrument panels and handling equipment can also be supplied. By buying all this equipment from Sunbeam, you obtain the many added advantages of dealing with a single supplier—in purchasing, planning, delivery, installation and service. For a prompt analysis of your requirements, write for the name of your nearest Sunbeam representative.

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*Industrial Furnace Division*

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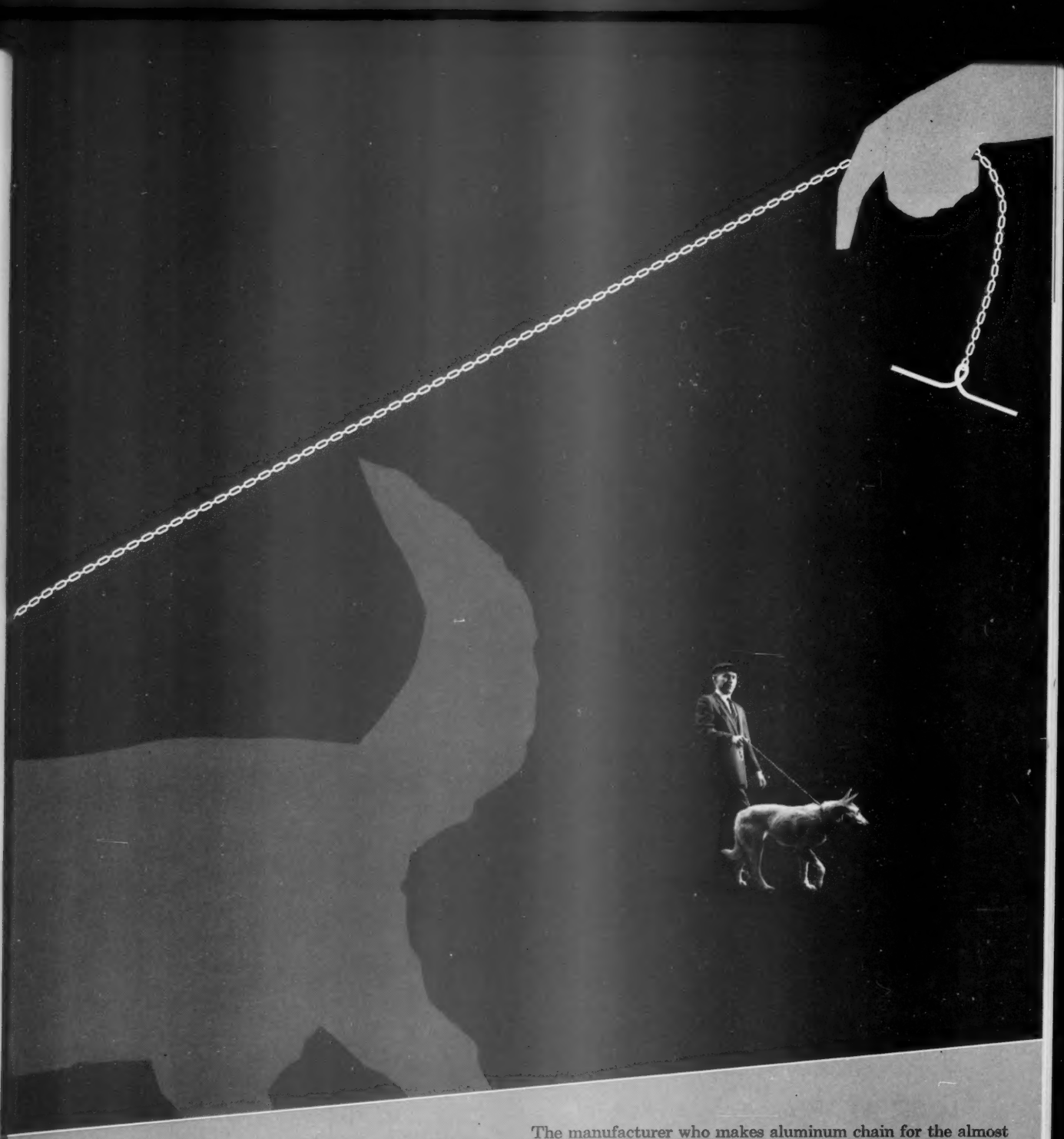

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Alcoa has set up a special department to work with you on profitable new ideas, new uses for aluminum wire. For immediate action, write ALUMINUM COMPANY OF AMERICA, Wire Products Development, 1993-H Alcoa Bldg., Pittsburgh 19, Pa.

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# ADJUSTABLE DRAW-CAST DIE BO

## FOR WET OR DRY DRAWING

The new Coulter & McKenzie ADJUSTABLE DRAW-CAST DIE BOX with true center-line pivotal action takes *all* the guesswork out of wire casting! You can *quickly* and *positively* establish the desired loop diameter and pitch of your wire with just 2 simple adjustments.

### LOOK AT THESE ADVANTAGES:

1. Positive Adjustable Control of cast and pitch.
2. Completely eliminates or greatly reduces skilled use of casting rolls.
3. Positive locking of controls and die insures uniform constant cast, coil after coil.
4. Graduated indication permits keeping records for quality control and duplication when changing sizes or analysis.
5. Easy to install on most types of wire drawing equipment.

| MODEL NO. | MAX. DIE SIZE CASING O.D. | NET WEIGHT | DIMENSIONS | | | |
|---|---|---|---|---|---|---|
| | | | A | B | C | D |
| 1 | 1″ | 8 lbs. | 2 5/8″ | 4″ | 6″ | 4 1/2″ |
| 2 | 1 1/2″ | 14 lbs. | 2 7/8″ | 4 1/2″ | 6 1/2″ | 5″ |
| 3 | 2″ | 125 lbs. | 5″ | 8″ | 9 3/4″ | 14″ |

Model No. 3 (Illustrated) may be arranged for direct water cooling of die casing.

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# The Wire Outlook

Let's do a little crystal gazing. There are many reasons why our country should remain strong and look forward to better times. Some of the main factors are: a) population will continue to increase, creating new markets for goods and services; b) the history of more efficient production is that many new jobs are created that more than take up the slack; c) more workers with ever-growing incomes will increase purchasing power; d) past records show a doubling of production every two decades; e) savings will grow, creating new funds for industrial expansion; f) research will bring into being many new products and major industries; g) people will want and will acquire lots of things they don't have today; and h) vast expenditures for new schools, hospitals, highways, plants, equipment, homes, and the like will have to be made to keep pace with growing needs.

This is not to say that the present slump in business is not serious—it cannot be treated lightly and if allowed to continue to a point where public confidence is affected, it could easily snowball into something more than a corrective recession.

While the summer months are traditionally slow due to vacations, heat, model changeovers, etc., and while the makers of big cars have yet to prove their contention that they are making what the public really wants now, business barometers of the last couple of months would seem to indicate that there is some sound basis of hope that the tide has ebbed to its low point and will move upward gradually in the Fall. No boom, however, can be expected to begin this year.

Regarding those tax cuts of which we have heard so much, the Government is in a dilemma. Its own needs have risen and have created a deficit of $3 billion for the fiscal year just ended. If taxes are cut by $6 billion, it is estimated that because of lowered earnings this year, next year's budget will run around $18 billion under income. Living within its income by reducing wasteful foreign aid, by eliminating subsidies, notably farm, by overhauling the postal services, and by reducing the power and spending of our sprawling bureaus, are steps that politically-minded Washington isn't apt to take. If it did, taxes could be cut and there could be a surplus.

The reciprocal trade agreement does not appear to be working to the advantage of American manufacturers. While our exports of machinery and equipment are down from 30% of production to 10%, the volume on imported machines is growing constantly. The same trend is being noted in wire and merchant wire products. A workable solution was presented in the house organ of one of the large steel and wire companies recently, in which it was suggested that, instead of a tariff barrier that might depress business at home and abroad, quotas be set up for each country.

Under this proposal, for example, based upon a 5-year average, a country with a capacity for making 10% of the world capacity of barbed wire would only be allowed to export to us an amount of its product equal to 10% of its capacity. This arrangement would be set up for each class of wire product and, of course, would be reciprocal. It would be fair to all concerned, the proponents of the plan believe.

Disregarding the effect of imports on its fortunes, the wire industry can hardly look for a material change in its status until an upturn in business takes place. Except for a few items like reinforcing mesh, orders continue to be slow and for immediate needs only.

The remedy isn't a matter of price-cutting to get business—it is largely one of decreased demand for things that could be produced and sold here, were it not for unlimited competition from any and every source. Price cutting is of little benefit to the manufacturer and of small advantage to the buyer.

With a long-range outlook that is bright with promise, it is up to business to take those steps that will overcome the recession. The Government is not going to contribute substantially to this of itself.

Edmund Duval Sickels
EDITOR

# STEELSKIN Lubricants

## —and how to use them...

This is another in a series of advertisements cataloging the complete line of Steelskin Lubricants. Keep this for handy reference.

No. 4 of a series

| PRODUCT | SHIPPING INFORMATION | USES |
|---|---|---|
| CEN SPECIAL POWDER | 370# Net FIBER DRUM | Used for producing heatron and zig-zag spring wire with a gray finish over W-Coated rods, and an excellent gray spring wire finish from limed rods. |
| 357 POWDER | 350# Net FIBER DRUM | Our newest development for drawing rod or wire coated with lime or W-Coating Compound. End uses include galvanizing, tire bead, poultry netting, screen cloth, springs, nails, rope, etc. |
| REDSKIN #2 POWDER | 400# Net FIBER DRUM | A new development similar to REDSKIN #1 except that it gives a redder color. Highly accepted for many copper-coated finishes including welding rod. |
| 320 GREASE | 420# Net STEEL DRUM | A mineral and fatty oil base grease for use in producing bright plating quality wire two holes, and more, from lightly limed stock. |
| 1231 COMPOUND | 480# Net STEEL DRUM | A non-foaming wet-drawing lubricant for intermediate and fine sizes. It serves equally well for ferrous and non-ferrous wire. It is also satisfactory for phosphate- and metallic-coated finishes. |
| 2736 GREASE | 400# Net STEEL DRUM | A new one-hole grease offering good lubrication, a bright finish, and containing rust inhibiting chemicals. |
| 4165 POWDER | 360# Net FIBER DRUM | Highly recommended for drawing prestressed concrete pipe wire with a dark uniform finish, lead-coated and lime-coated stainless steel rod, music wire, and valve spring wire. |
| 10-M POWDER | 350# Net FIBER DRUM | For producing nail wire with a simulated sull-coat finish with excellent nail-cutting properties. |

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METAL WORKING LUBRICANTS

**R. H. MILLER**

**COMPANY, INC., Homer, N. Y.**

# WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 33 AUGUST, 1958 No. 8


# The Regional Meeting In Los Angeles

**June 5 and 6, 1958,** proved to be highly satisfactory dates in the history of The Wire Association, for at that time our members enjoyed a most profitable and interesting two-day session of the West Coast Regional Meeting at Los Angeles, California.

★ ★ ★

**Registration,** which started at 10:00 A.M. on Thursday, June 5th, wound up with a total of 203 before the meeting was over.

★ ★ ★

**The** technical sessions opened in the Garden Room of the Statler Hotel and lasted throughout the afternoon, with **Clyde Wilson,** Wire Sales, **Bethlehem Pacific Coast Steel Corporation,** Los Angeles, serving as moderator.

★ ★ ★

**The** first paper, "Some Problems of the Manufacturers of Low Carbon Steel Wire Products," was presented by **G. Leslie Killian,** President of **Acme Wire Products Corporation,** Gardena.

★ ★ ★

**Mr. William K. Gardner,** President of the **Gardner-Clark Spring Company,** Los Angeles, followed with a paper on "Problems in Spring Making."

★ ★ ★

**"The** Large Pay-Off Coils" was the subject of the third paper, which was given by **E. Jefferson Crum** of the **R. H. Miller Company** of Homer, N. Y.

Joseph F. Conlan (Program Chairman)

★ ★ ★

**Another** paper on the same subject, but from the wire users standpoint, was "The Merits of Large Coils," which was presented by **R. W. Davis,** President of the **K-Lath Corporation** of Alhambra.

★ ★ ★

**E. S. McGlone, Jr.,** Field Engineer, **Anaconda Wire and Cable Company,** Los Angeles, next presented a paper entitled "Conductor Economics."

★ ★ ★

**Another** insulated wire paper was given by **Frank Cianchetti,** Engineer, **Essex Wire Corporation** of Anaheim, California. The title of his talk was "Thermalex-F."

★ ★ ★

**A** final paper, concerned with the matter of safety in the wire mill, was presented by **W. C. Clements,** Assistant Metallurgical Engineer of the **Bethlehem Steel Company,** Bethlehem, Pennsylvania. The title of his talk was "The Steel Production Manuals."

★ ★ ★

**The** technical sessions concluded around 5:00 o'clock with the showing of a film "Knowing is Not Enough."

## Plant Tour

**On** Friday, June 6th, busses left the Statler Hotel at 9:00 A.M. for Fontana, California, carrying approximately 80 persons to the West Coast's only fully integrated steel mill—that of the **Kaiser Steel Corporation** there.

★ ★ ★

**The** company brings in to the mill from its own mines coal, iron ore and limestone, the basic ingredients for the making of steel. It is said that this mill has the shortest rail haul for its ore of any mill in the country.

★ ★ ★

**Coke** is produced from the coal brought down from Utah. One of the interesting features of the operation is the manner in which water is brought in and conserved. The coal is wet down in Utah and when it is dumped at Fontana the water is drained off for further use in quenching the coke. Some 6000 gallons per car are thus available. As each oven produces 14½ tons of coke and the opera-

tion is repeated 318 times every 24 hours, the operation consumes great quantities of water. Other water used at Fontana comes from deep wells that the company has drilled on its property.

★ ★ ★

**Three** new oxygen furnaces, the first in the Pacific areas, are under construction for the production of high grade steel. There are 3 blast furnaces in operation and a 4th under construction. These later on will supply the oxygen furnaces. Each furnace will produce 65 tons of steel every 40 minutes, using 80% of hot metal and 20% of scrap.

★ ★ ★

**Nine** open hearth furnaces, each turning out 225 tons of steel every 9½ hours, are tapped with ingot molds of 4 to 16 ton sizes, which, after soaking, will be run through the blooming mills.

★ ★ ★

**From** these basic operations, Kaiser manufactures plate, strip, sheet, skelp, structural steel, rod, bar, pipe and a number of fabricated products.

★ ★ ★

**The** company is installing the latest types of equipment to eliminate smoke that might contribute to Los Angeles' smog problems when the wind is from the East.

**At** the conclusion of the tour, a tasty luncheon was served to the visitors through the courtesy of the Kaiser Steel Corporation.

★ ★ ★

**The** tour proved interesting, the guides were well-informed and made every effort to see that their guests' questions were fully answered.

## The Dinner

**In** the evening of June 6th, 186 members and guests gathered in the Los Angeles Room at 6:30 for refreshment. The dining room —the Golden State Room—was opened at 7:30 o'clock for the banquet.

★ ★ ★

**For** the after dinner speaker, the Program Committee had arranged to have **Frank O. McIntyre,** Director of Public Relations of the **Southern Division of the California Teachers Association,** make the principal address. His subject, "Building a Better Mousetrap is Not Enough," contained many pointers on policy, as well as proving entertaining. Mr. McIntyre is one of the outstanding speakers of the area.

★ ★ ★

**A** cordial greeting and welcome to the meeting was extended by Association President, **Tom M. Girdler, Jr.**

## Door Prizes

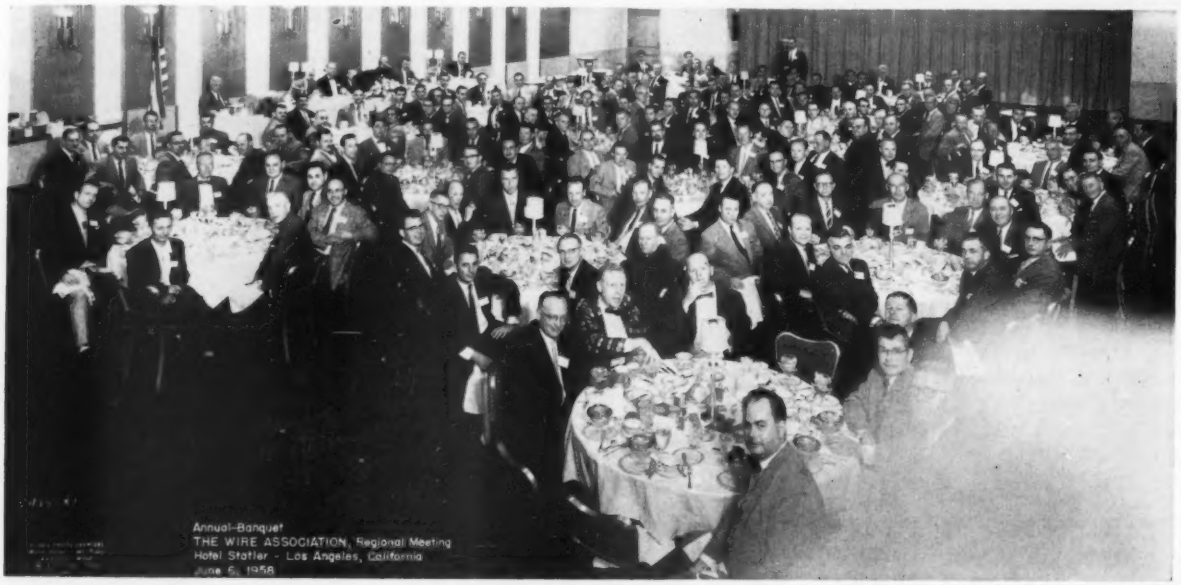
**One** of the events that have characterized our West Coast meetings for a number of years has been the distribution of door prizes to dinner-ticket holders. The prizes were numerous, varied and attractive, and were made possible through the generosity of a large number of wire, machinery and supplies manufacturers, who contributed them to add an extra element of interest to the dinner program.

★ ★ ★

**The** donors of these prizes were:

**Acme Wire Products**
**Banner Metal Manufacturing Co.**
**Berards' Spring Mfg. Corp., Ltd.**
**California Spring Co., Inc.**
**City Wire & Iron Works, Inc.**
**Clock Broiler Steak House**
**Dal Rae Restaurant**
**Gardner-Clark Spring Co.**
**Heat & Control, Inc.**
**Holister Coil Spring Mfg. Co.**
**Industrial Wire Products Corp.**
**Johnson Steel & Wire Co.**
**K-Lath Corporation**
**Krusen Wire & Steel Co.**
**Little Joe's Restaurant**
**Los Angeles Spring Bed Co.**
**Metallurgical Products Dept., General Electric Co.**
**Morgan Construction Company**
**New England High Carbon Wire Co.**
**Nichols Wire & Aluminum Co.**
**Pacific Smelting Co.**

(*Please turn to page* 928)




**Association's members and guests assembled for dinner at West Coast Regional Meeting in Los Angeles.** * * * * * * * * * * *

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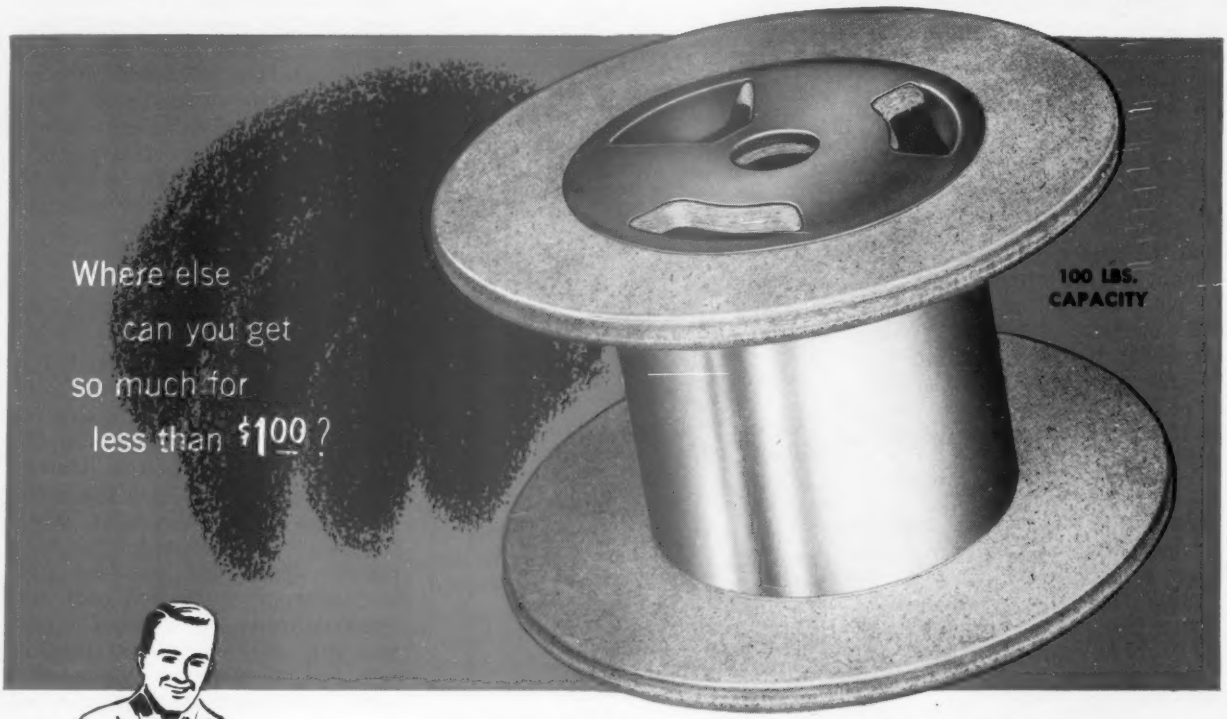
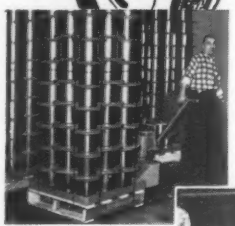
## with all the features of expensive returnable reels





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**NO OTHER NON-RETURNABLE REEL CAN OFFER YOU THESE FEATURES:**

- ★ Low initial cost reduces overall packaging costs. Non-returnable feature eliminates all headaches involved with returnable reels.
- ★ You can always have a shiny, new, attractive package with every shipment of wire.
- ★ Smooth flange periphery assures easy removal over the head without snagging—permits packaging finer gauges of wire on larger packages.
- ★ Reel is precision-accurate and runs true. Arbor hole is reinforced and steel-bushed.
- ★ Rigid construction, with heavy gauge steel barrel and steel reinforcing end plates. Welded assembly.
- ★ Phenolic flanges resist wear, absorb shocks, take considerable abuse without breaking or cracking.
- ★ Flat flange surface permits palletizing packaged wire. No protruding bolts, or depressions, to prevent stacking.
- ★ Fits your present spooling equipment—no need for adapters or back-up plates.

*Other sizes available — Write for quotations*

**ACROMETAL PRODUCTS, INC.**
616 5th Street North, Minneapolis 1, Minn.

# The Merits of Large Coils

by Robert W. Davis, President
K-Lath Corporation
Alhambra, California

A paper delivered at the West Coast Regional Meeting of The Wire Association at Los Angeles, California, on June 5, 1958.

**Mr. Chairman** and members of The Wire Association, I feel that perhaps I am in the wrong spot here today because I don't have the broad experience in the wire industry that most of you gentlemen have, so I approach this subject today very humbly.

★ ★ ★

**Most** of you however see the wire from the mill side of it so I am going to try to talk about it from the customers' side in regard to what we see when he gets into our place and will show you some of the operations that we have and talk about the merits of the pay-off pack, the tower pack, the pay-off coil or whatever you want to call it. We like them and like them very much.

★ ★ ★

**Light** wire in the higher gages has been available for some time either spooled or in packages for running through high speed machines but only within the last two or three years that gages from twelve gage up to nineteen gage. For example, they have been available on pay-off packs, tower packs, or pay-off coils.

★ ★ ★

**Three** years ago we moved into our present quarters. We are a small manufacturer and we had to move into at least — well, we thought so at the time that we had to move into whatever we could get. So, we found an old lumber yard and revamped the thing a little bit and put some machines in there and started to work. We had inadequate storage and our dock facilities were not good and these semi automatic machines we have problems with them and they were running at that time about sixty per cent of their efficiency while running six hundred units in the day shift. At that time the only wire that we could get was catch-weight coils of one hundred and fifty pounds each. To give you some of the disadvantages in our operation of the catch-weight coil and then tell you something of the advantages of the pay-off pack or tower coils or pay-off coil, first, I would like to tell you of the disadvantages of the catch-weight coil that we were using two years ago or over. In the first place it took two men to unload a car or unload a truck and took them about two hours to unload that with a fork lift and it took one man up on the truck and another one on the fork lift. The one man on the truck loading the fork lift and the other fellow carrying it on the fork lift and oftentimes the work would run into the catch-weight coils and a lot of damage was caused in tangling when run through the machines. In the first place we had to store on the floor.

★ ★ ★

**Unfortunately** I suppose a small manufacturer finds himself in a position that we don't have all the fine handling that you have in the mills and don't have all of the fine warehouse storage that you have, so catch-weight coils by necessity have to be stored on the floor where they were subject to dirt at times or dust and maybe some oil and might get some water on them at times. You just can't stack catch-weight coils up very high and other than handling them with a fork lift, otherwise you have to handle them yourself or manhandle them. We could ill afford the wasted space that occurred by using catch-weight coils and after we stored them and brought them out to the machine we again have to handle them with a fork lift subjecting them to additional damage by the fork for at times the men are careless. Secondly we got them in an area where the machines operate. You have to man handle them and roll them across the floor and then drop them over these horizontal slips in which case we continually have the problem of tangling in the swift turning on a horizontal plane for if you get any drag on the coil the wire pulls into the coil and then you are in trouble.

★ ★ ★

**We** were making about eighteen to twenty stops a day and we analyzed our down time about two years ago and found over eighty per cent of our down time was for two reasons. One reason was the tangles in the coil due to damage or pulling through and the other was changes of the coils. They weighed one hundred and fifty pounds apiece and we were constantly going back and changing and putting on new coils. The cost was very excessive in our production and we were not competitive on the market, so we started doing something about it and started building up our coil towers by butt welding catch-weight coils together and building up these coil towers before we butt them on the machine, but there again that was very expensive and extra labor. Also, if it wasn't done right or carefully we again were subjected to a certain amount of damage. We still have considerable tangling, however we did reduce our down time by building up our tower coils.

★ ★ ★

**About** that time one of the suppliers came to us with the pay-off pack or tower coil or tower pack that had the pellet wire spider on the inside. We quickly picked it up. In fact, they were the only ones that furnished us with tower coils.

(*Please turn to page* 926)

# Problems in Spring Making

by William K. Gardner, President
Gardner-Clark Spring Company
Los Angeles, California

A paper delivered at the West Coast Regional Meeting of The Wire Association at Los Angeles, California, on June 5, 1958.

**This** subject should be problems of the spring manufacturer serving the Furniture and Bedding Industry on the West Coast.

★ ★ ★

**A** brief history of this industry may help to understand our problems. From the beginning of time people have had something to sit on. No doubt this was the start of problems for all industries.

★ ★ ★

**I** believe you follow my thought but before springs were invented there was not too much comfort in sitting. The first chair was a rock, then wooden benches proved softer and later pillows were added to make sitting more comfortable.

★ ★ ★

**About** 1860 someone discovered that steel could be soft and could be used for more comfortable seatting by coiling wire into a spring. This was first accomplished by hand winding basic wire around a wooden form to make a coil spring. These springs were placed in a chair seat, tied in position, padded on the top and by that time people who could afford it were very happy sitting.

★ ★ ★

**The** demand for coil springs in furniture increased to such an extent that in the 1890's a semi-automatic spring coiling machine was designed. The loose ends of the coils were bent down with hand tools until about 1908 when a knotting machine was developed to do this operation mechanically.

★ ★ ★

**The** semi-automatic coiler and knotter was standard equipment for the industry from 1908 to 1937 when a fully automatic coiling and knotting machine was made available to the industry. About 1924 some individual firms developed automatic equipment for their own use but this was not available generally to the industry.

★ ★ ★

**In** the past few years other automatic assembly equipment for the assembly of innerspring mattress units has been developed and made available to the industry. Some developments in the assembly of marshall type inner spring units have added to the efficiency of the industry.

★ ★ ★

**To** get back to the subject of the problems of spring manufacturers on the West Coast, let me say in 1926 there were four manufacturers serving most of the West Coast, including Arizona and Honolulu. Today we have a total of twenty-nine bidding for this same business. When you consider that the rubber industry has taken some twenty to twenty-five per cent of our sales volume with their well organized sales and advertising program you can see the spring manufacturers must live with what is left of this dollar volume.

★ ★ ★

**Prices** of springs for the Furniture and Bedding Industry here on the West Coast are as low as anywhere in the country. Then there are other things. Our labor scale is the highest in the country due to the lack of unity of our manufacturers. I guess I should not say this, but the wire mills charge us some 95 cents per hundred weight more than in many areas of the country. This surely adds to our problems, and it seems to me that there could be some adjustment in this differential.

★ ★ ★

**To** sum up the problem, we have lowest selling prices, the highest labor and material costs, and the least amount of unity among the manufacturers of springs for our industry here than anywhere in the country.

# Some Problems of the Manufacturers of Low Carbon Steel Wire Products

by G. Leslie Killian, President
Acme Wire Products Company
Gardena, California

A paper delivered at the West Coast Regional Meeting of The Wire Association at Los Angeles, California, on June 5, 1958.

**The** manufacturers of Wire products, many of whom operate on a contract or job shop basis, have one special condition to meet in addition to the usual problems of taxes, rising costs, labor problems, etc.

**This** problem lies in the minds of people in general or in the attitude they have toward wire products. For example, a man who requires baskets would expect to pay more for baskets fabricated of steel rods than he would for the identical basket made of wire.

★ ★ ★

**This** attitude toward wire is partly due to the fact that most of us in the business do not place a high enough value on the ingenuity and equipment required to efficiently produce these items.

★ ★ ★

**The** major items of equipment we use are machines for straightening and cutting, four-slide wire formers, resistance welders and punch presses. We all depreciate this equipment for tax purposes, but how many figure the wear and tear, and eventual obsolescence, when quoting a job? These are actual manufacturing costs, and we all pay such costs when we buy an automobile, a kitchen clock or a radio. In fact they are included in the price of practically all manufactured items except those made of wire.

★ ★ ★

**My** assignment today, fortunately, did not say that I must have the answers to all problems I might mention, and I certainly don't have the answer to this one.

★ ★ ★

**I** can remember when this was not much of a problem. In 1929 when I started in the wire products business our equipment consisted of two spot welders of the so-called "two pedal type". The operator of one of these machines sat on a stool and applied weld pressure with his left foot while welding was controlled by a sort of dancing action of his right foot on the other pedal.

★ ★ ★

**We** shipped all wire from the East, straightened and cut in bundles called "Snakes", the wire was cut to length on a foot powered cutter, and forming was done on hand operated benders and around wooden blocks.

★ ★ ★

**With** this equipment, however, we turned out the intricate scalloped bell and tulip shape lamp shade frames then in favor.

★ ★ ★

**If** an order for a dozen such frames were to be entered in our shop today, tooling alone would probably require six weeks.

★ ★ ★

**Those** old time wire workers were real mechanics, but there were never enough of them, and the industry could not have made the progress it has if dependent on that kind of skill. Today with our electronically timed, air operated projection welders, it requires more skill to load a jig than to do the welding.

★ ★ ★

**Our** materials no longer have to be shipped in from the East as we have four sources here in California. And incidentally, whatever other problems we have, wire quality is certainly a very minor one, and our mills are to be complimented on the way in which they deal with the many complexities in high speed wire drawing.

★ ★ ★

**In** common with most business our problems are chiefly those concerning employees, customers and competitors.

★ ★ ★

**I** list employees first because, if that is sufficiently well taken care of, the other two may no longer be problems. Since experienced men are seldom available, we all employ green hands and train them.

★ ★ ★

**Capable** supervision is a necessity and unfortunately our best trained supervisory personnel sometimes decides to join the ranks of our competitors by opening a shop of their own.

★ ★ ★

**Possibly** a reversal of this splitting up tendency will occur some time through mergers wherein the United Wire Products Corporation of California is formed, and operated with the combined experience and know-how of a number of these men.

★ ★ ★

**Such** a merger would probably strengthen the industry, but it probably won't happen soon as we are all too contented as big frogs in small puddles.

★ ★ ★

**There** is one form of combining, however, toward which a few preliminary steps have been taken. Ours is one of the few industries that do not have an association, and a few meetings have been held with the intention of grouping together as many as possible of the wire products manufacturers for certain definite objectives such as

1. **Mutual confidence through becoming better acquainted.**
2. **High standards of competition—without attempting to regulate prices.**
3. **Credit loss reduction—through interchange of credit information.**
4. **Saving through group purchases. As I say, this is in the formative stage, but a letter will soon go out to all shops urging their support.**

★ ★ ★

**The** points discussed thus far being all of a generalized nature it may be well in closing to briefly mention a few specific problems which may also be worthy of general discussion. For example, welding aluminum wire. In my opinion, aluminum, due to its high electrical conductivity and very short plastic range will never be a popular material in job shops where resistance welding is used.

★ ★ ★

**Another** question: Does it pay a wire products manufacturer to have his own plating department? We have for many years maintained such a department, but did so only because we had a proprietory item requiring a special careful handling.

★ ★ ★

**Extra** bright clean wire is another problem, and our wire mill representatives will probably have some sound statements as to why

(*Please turn to page* 927)

NEWS OF INTEREST TO THE WIRE AND CABLE INDUSTRY VOL. III No. 4

# WIRE Recorder

T.M. REG. U.S. PAT. OFF. MONSANTO CHEMICAL CO.

PUBLISHED BY MONSANTO CHEMICAL CO., PLASTICS DIVISION, SPRINGFIELD, MASS.

Monsanto

## New Monsanto Polyethylene Compound for Telephone Primary Insulation

Monsanto is pleased to announce the introduction of a new natural polyethylene insulating compound to manufacturers of telephone cable. Currently marketed under the experimental designation 122531, this compound will be identified as MPE 10.

The extrusion of telephone primary insulation involves the forcing of molten polyethylene through a small orifice at relatively high pressures and rates. It has been shown that those factors present in this process are the same ones tending to produce melt fracture, the melt fracture point referring here to that point at which the extrudate exhibits surface roughness. Reducing orifice size, increasing output rate, and increasing pressure all tend to increase roughness. Since extrusion of insulations with small diameters and thin walls approaches conditions causing melt fracture, excessive surface roughness in telephone primary insulations may be a difficult problem to overcome. It is often the case that the allowable speed of an insulating operation is limited by rugosity rather than mechanical considerations.

While occasionally changes may be made in extrusion conditions which will effect a minor improvement in the degree of roughness obtained at any given speed (e.g., more streamlined tooling, improved screw design, more favorable temperature conditions), the basic solution to this problem obviously required the development of a polyethylene resin with less susceptibility to melt fracture.

(*continued on page 4*)

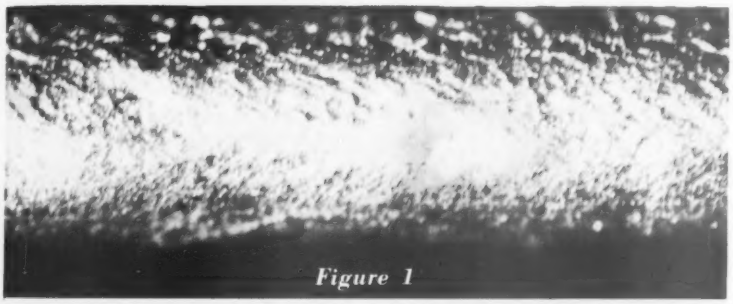


*Figure 1*

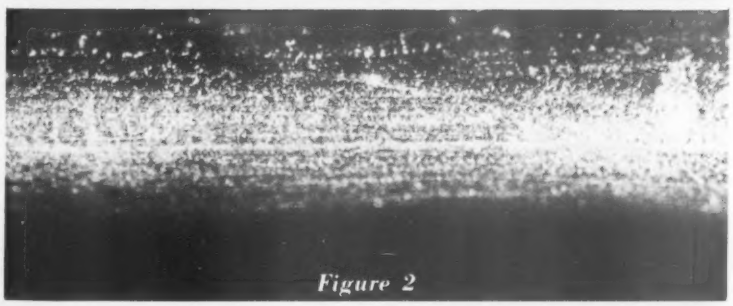


*Figure 2*

## Telephone Cables Headed Underground in Urban Areas

Complete underground telephone distribution plants have been in existence for many years in large metropolitan areas; however, their use in urban locales is a new innovation to the telephone industry.

The high cost of waterproof cables formerly utilized limited the use of such a system to heavily populated areas. Used in cross-country or as intercity trunk and toll cables, the previously used system of lead sheath paper insulated conductor cable was highly satisfactory. However, when used in a location where many splices and distribution terminals were necessary, the cost of installation or termination made such a system impractical. Another disadvantage of such an arrangement was that frequently when changes or repair operations were required moisture did seep in at points of splicing, sheathing, etc.

Scientists and inventors, engaged in overcoming the various disadvantages of paper insulation, experimented with several other systems, but eventually selected a plastic-insulated conductor cable. In an experimental period of three to four years the plastic cable was placed on a field trial prior to being made available for general field use.

The new cable, with its plastic-insulated conductors, was found to be unaffected by moisture in the atmosphere, and new terminating and splicing techniques were devised resulting in a new line of terminals of the "Ready-Access" variety. With its unusually high resistance to moisture, the plastic-insulated cable was found to be ideal for underground installations.

First used on a trial basis in three areas, the new system is now expected to be put into use in many areas where new housing developments are being constructed.

U.S. BUILDS RADAR FOR SATELLITE SPOTTING - The Defense Department has announced plans for a radio-radar network capable of detecting even silent satellites. Work is already in progress on the new installation and should be completed by the end of this year. Although it is felt that satellites are unlikely to be of immediate military use, the new radar system will "insure that silent satellites will not be able to orbit over the U.S. without being detected and tracked."

* * *

CABLE TO CROSS BALTIC - A new telephone and telegraph cable connecting Poland and Denmark has been announced as a joint project of the two northern European nations. The work and cost of the project will be shared equally by the two countries. This latest addition to the growing list of undersea communications is expected to be completed by 1960.

* * *

TV EDUCATION WINS APPROVAL - A five-year educational TV experiment being conducted at Hagerstown, Maryland, recently concluded its second year. To date 23 schools and 12,000 pupils have participated in the program which has generally been looked upon as an outstanding success. Next year there will be 48 schools and 18,000 pupils viewing courses on a five-channel circuit transmitting a variety of subjects throughout the city's school system.

* * *

CONSTRUCTION INDUSTRY UNHAMPERED BY RECESSION - With the exception of industrial expansion, all phases of construction are moving ahead rapidly. At the present time definite indications point toward even greater development in future months with highways, residential building, utilities and commercial enterprises all surpassing previous peak figures.

* * *

POWER PLANT HAS AUTOMATIC TROUBLE SHOOTER - Louisiana Power and Light's Sterlington station is now equipped with a new electronic operational-information system which performs control functions on a continuing basis. The system, developed by Daystorm, Inc., of LaJolla, California, is in reality a general-purpose computer that provides an automatic record of over-all operating conditions, eliminating many of the usual dials, gauges and recorders generally necessary to power plants.

* * *

ELECTRONICS AID BEDRIDDEN STUDENT - Roddy Mundy, a 14-year-old student of Ottawa, Canada, has managed to keep pace with his eighth-grade class through an electronic intercommunication system connecting his bedroom with the schoolroom. A victim of polio at the age of 5, Roddy attended classes in a wheel chair or with canes; however, a series of operations last Fall necessitated that he remain in bed for a lengthy period. He now asks or answers questions with the aid of a combination microphone-speaker which he will use until he returns to classes in September.

## 250-Thousand Feet of Plastic-Coated Wire in New Machine

"Gertrude," complete with electronic brain, electromechanical muscles, punched-card co-ordination and more than ¼-million feet of plastic-coated wire, now fills orders automatically at the Brunswig Drug Company in Los Angeles, California.

"Gertrude" happens to be the latest development in automatic order-picking machinery, and she is capable of filling orders for as many as 160 different products, in lots up to 99, in a few seconds.

The machine, which was developed by the Industrial Electronic Engineers of North Hollywood, California, at a cost of $250,000, has reduced the number of order packers required from 20 to 11 at peak hours and 6 under normal conditions.

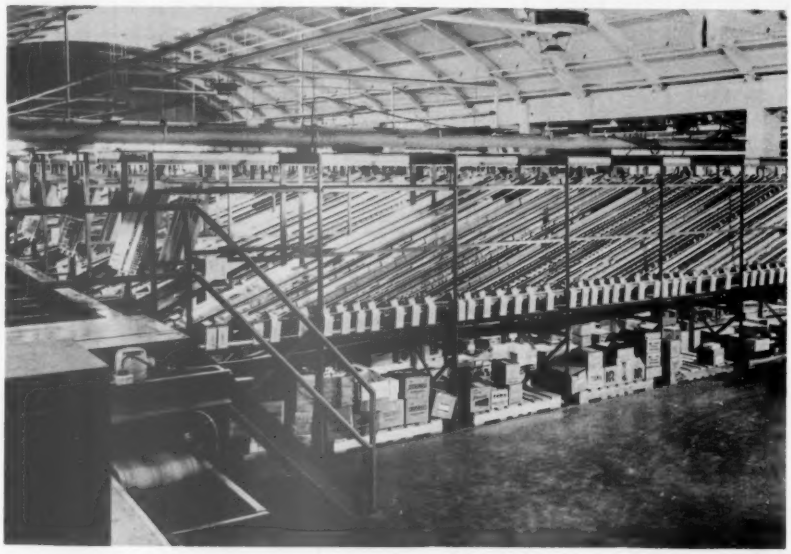
Approximately 10,000 square feet of floor space is utilized for the complete setup of the machine, with two facing banks of nine bays each. Individual bays hold 100 items each, which may be in single packages or quantity packs of from 6 to 24 units. In between, and at right angles to the bays, are 5 parallel belt conveyors which lead to packing stations.

The mechanical giant operates with the aid of punched-card data converters, with programming mechanism operated by means of a magnetic memory storage drum. Chute-gate solenoids and release gates operate as electromechanical moving parts and primary conveyor belts serve the eighteen 40′ bays. To enlarge the machine's capacity, all that would be necessary would be the installation of more bays and the extension of the collector conveyors.

The present control equipment is capable of handling up to 10,000 different items compared to the 1,800 now being stocked. Brunswig's eventual plan is to increase capacity to 5,000 items — or about 80% of the daily business of the warehouse as compared with the present total of about 50% of the warehouse traffic. In the first three months of operation, "Gertrude" rated a high of 99.7% usefulness.

The official name of the machine is the RVS Mark I in honor of Brunswig President, Roy V. Schwab, who was largely responsible for the project under which "Gertrude" was developed. The project was initiated in 1954 and was tested first in prototype. Work on the full-scale model was not begun until February of 1954 when the hundreds of individual parts and thousands of feet of plastic-coated wire began to take shape at the Los Angeles plant.

Now that this initial model has been successfully completed, Industrial Electronics feels that other machines based upon the same concepts may be developed at costs starting as low as $40,000. Similar setups could be utilized with considerable advantage by grocery warehouses, photo supply distributors, auto parts suppliers and other similar operations.



*One section of Brunswig Drug Company's automatic order-picking machine, showing several of the 18 bays which are capable of holding up to 10,000 different items.*

## Electronics Industry in West Grows Rapidly

According to business leaders on the Pacific Coast, 1958 will be a record year for the electronics industry in that area. Based on existing conditions and anticipated future expansion, the industry's growth is now only in its earliest stages.

The reason for all of this optimism has several important facts to back it up. With the military taking more and more of the electronics dollar and civilian production turning to a larger degree of automation, further growth of the electronics industry is inevitable. Manufacturing, transportation and distribution are all included in the fast-moving trend toward extensive automation. The West Coast can look forward to a large share of this future business since 20% of all electronic equipment produced in the U.S. is manufactured in California. The ten other western states account for an additional 4% of the nation's total output of electronics production.

Sales during 1957 reached a total of $1.775 billion, a figure that should be bettered this year. Because of added emphasis on missiles, production of many electronic items will be automatically increased.

More than 95% of the electronics plants in California are located in the Los Angeles-Orange County and San Francisco-Oakland areas. Shipping costs are kept at a minimum by these concerns because of their close proximity to the nearby aircraft and missile manufacturers.

## U.S. Electric Capacity Must Triple by 1980

According to a recent report by the staff of Washington's Federal Power Commission, the electric utility systems of the U.S. will require three times their present capacity by the year 1980 in order to handle projected and anticipated requirements.

In their new report the Commission staff considered electrical power requirements and supply through 1980. Their estimate for installed capacity that year, in order to accommodate projected loads, reached a total of 394-million kilowatts. This figure would include some 343-million kilowatts and total utility energy requirements of 1.9-trillion kilowatt-hours. The report also anticipated an increase to 28.5-million kilowatts for industrial capacity by 1980.

## Freight Controlled Electronically

A new age in railroading that is saving railroad men both time and money has come about through the introduction of electronics. In recent months two railroads have invested more than $4 million in electronic equipment for two midwest rail yards, which themselves were constructed at a cost of $18 million. Another railroad installed hundreds of thousands of dollars in *additional* electronic equipment to an already completed $20-million Chicago switch yard.

It is expected that the New York Central's new $14-million Elkhart, Indiana, yard will pay for itself in about three years by reducing the line's operating expenses in that area. Another new installation in Cicero, Illinois, operated by the Burlington Railroad, is giving "Faster, more dependable freight schedules, reduction of damage to shipments, elimination of duplicate switching . . ." plus a 10% return on investment after taxes according to line president H. C. Murphy.

Equipment installed with the money allocated for electronics at the New York Central yard in Elkhart includes a closed-circuit TV network that permits inbound freight cars to be observed instantly at the general yard office. Before an incoming train has stopped, its freight car numbers have been checked and recorded.

Another piece of equipment now in use at Elkhart is a magnetic memory which stores the destination of each car and later routes the car automatically to one of 72 classification tracks where outbound trains are made up.

Nine analog computers to select and integrate information on the speed of cars moving through the yard are also in use. Control systems regulate speed while other equipment, operated by a dial at an operator's desk, moves cars by remote control.

Five individual radio networks speed up the work throughout the yards. Teleprinter circuits and "talk-back" systems reaching all areas of the yard also help to speed up operations. Photoelectric cells indicate when cars are approaching retarders, and electronic scales determine the weight of cars still in motion.

Future plans indicate that routing information for entire trains may be preprogrammed on tape, then introduced automatically to a switching system to set the train in motion and on the way to its final destination.

## Plastic Survey Reveals High Usage

A recent survey by the staff of "Insulation" magazine has indicated that the use of plastics in electrical insulation is now at an all-time high. It also pointed out that an enormous market now exists for plastics in the fields of electrical and electronic manufacturing. More than 75% of the industries contacted in the survey reported some degree of usage of plastics in their production.

Conducted as an impartial survey by the magazine staff, the final tabulation of questionnaires revealed a variety of practices and opinions related to the inclusion of reinforced and laminated plastics in insulation. Most noteworthy was the rapid growth in the over-all use of plastics in recent years.

Persons contacted included individuals employed in the manufacturing of electrical and electronic components as well as those engaged in the manufacturing of electrically powered apparatus. A higher heat resistance to plastics designed for use in insulation was the characteristic which most of the 16,000 individuals in the survey suggested be improved.

In addition to suggestions for improved thermal properties were recommendations for improvements in punching, machining and fabricating qualities, as well as improved physical properties and strength. Many of these improvements have already been incorporated into Monsanto plastics, with still other refinements currently in the planning and experimental stages.

---

**NEW COMPOUND** (*cont'd from p. 1*)

With this thought in mind and continuing our policy of developing specific products for specific applications, Monsanto has introduced a polyethylene compound which will produce smooth insulations under extremely severe pressure and rate conditions. The superior extrudability of MPE 10 (122531) in telephone primary insulations has been thoroughly proven in commercial operations. Figure 1 illustrates the degree of surface roughness obtained in a telephone insulation under a given set of extrusion conditions with a commercial polyethylene compound. The improved product obtained with MPE 10 (extruded under the same conditions) is shown by Figure 2. These plates were made from microphotographs taken of the surfaces of the two insulations. Also, this improved surface is believed to reduce the frequency of sparker failures during subsequent twisting and cabling operations.

MPE 10 contains a nonstaining antioxidant and will meet all standard telephone cable specification requirements. It may be extruded under normal machine conditions and does not require any special precautions. Competitive extrusion rates are readily obtainable.

**PROPERTIES OF MPE 10 (122531)**

| *Property* | *Test Method* | *Typical Values* |
|---|---|---|
| Specific Gravity | ASTM D 792-50 | 0.92 |
| Melt Index | ASTM D 1238-52T | 1.5 dg./min. |
| Memory | — | 40% |
| Brittleness Temp. | ASTM D 746-54T | <−75°C |
| Tensile Strength | | |
| Yield | ASTM D 412-51T | 1475 psi. |
| Ultimate | " | 2100 psi. |
| Elongation | | |
| Yield | ASTM D 412-51T | 50% |
| Ultimate | " | 700% |
| Electricals @ 60 mc./sec. | | |
| Dielectric Constant | ASTM D 150-54T | <2.3* |
| Dissipation Factor | " | <0.0005* |

*After 3 hours mill rolling at 160°C

Monsanto

**MONSANTO CHEMICAL COMPANY**

**PLASTICS DIVISION—SPRINGFIELD, MASSACHUSETTS**

# Conductor Economics

by Edward S. McGlone, Jr., Field Engineer
Anaconda Wire & Cable Company
Los Angeles, California

A paper delivered at the West Coast Regional Meeting of The Wire Association at Los Angeles, California, on June 5, 1958.

I am extremely grateful to have been asked by Mr. Wilson to present a short talk before this meeting of The Wire Association.

★ ★ ★

**This** portion of your meeting has been assigned to the so-called Non-Ferrous Section of your association. Although of course the company with which I am associated, **The Anaconda Wire and Cable Co.,** is in the business of producing wires and cables of non-ferrous metals, we are more properly engaged in the production of electrical wire and cable. As my paper will be devoted to the subject of Electrical Conductor Economics I shall ask you then to think in terms of wire and cable in its varied electrical applications as opposed to wire for mechanical purposes.

★ ★ ★

**The** subject of Conductor Economics is most challenging because there is a genuine need for improvement; challenging because there are immediate steps that can be taken today to bring about better ways to attack this subject. With this in mind, we shall approach the subject of Conductor Economics in three separate areas. First, the urgent need for better standardization in our industry; second, we shall discuss new materials versus the old standbys and where each fits best; and third, we shall touch on the very important bearing that research has on conductor economics.

★ ★ ★

**In** order to discuss the problem of standardization it is necessary for me to talk to you not as a salesman, but from a point of view of an operating man, one who manufactures wire and cable products. I must take you backstage into one of our plants and explain to you just what problems we face, what hurdles we must overcome, in order to operate efficiently and economically and by so doing lower costs.

★ ★ ★

**We** attempt to operate our machines, rod rolling—wire drawing — stranding — insulating — and other equipment at as near 100% efficiency as possible. When the machines are not operating, they are not producing, and that means money down the drain. We must therefore be very careful how we control production. Our production control department is the most important cog in our manufacturing cycle. Of all its many duties, by far the most important is to see that our production runs for each and every machine are just as long as possible. The reason of course, is obvious. We must keep machines running, constantly bringing production up to the maximum. Conversely, short runs mean production stops—with consequent set-up charges for new runs. All of this costs money, both in labor, machine hour cost and lost production. This in turn means higher manufacturing costs and of necessity higher selling prices.

★ ★ ★

**The** director of purchases should be just as interested in working toward lower manufacturing costs as the manufacturer himself and one of the best ways to accomplish this is in the area of longer manufacturing runs. How is this done? Well, the biggest opportunity lies in the well known realm of simplification. Fewer sizes, fewer types make for longer runs. Longer runs mean lower costs. Conversely, more sizes and types mean shorter manufacturing runs and higher costs. And in the end the consumer invariably pays the bill.

**To** illustrate this problem, you might be interested in knowing that we have supplied 32 variations of just one size of a certain type of conductor. That is, 32 different ways to make a cable that does exactly the same job. This is difficult to believe, I know, however our customers specify different types of covering,—several different strandings,—several different thicknesses of insulations and coverings, plus all sorts of different combinations of these variables.

★ ★ ★

**Suppose** our production of this particular size and type of cable for a certain period is 1,000,000 ft. If we had just one type we would run each operation, drawings,—stranding,—insulating and cabling with just one set-up for each operation, but with 32 types we have average runs of only a little over 31,000 ft. for each operation—32 stops in production with 32 set-up charges—the increased cost is fantastic.

Ultimately the customer pays the bill.

★ ★ ★

**Now** add to this the variety of packages in use today. Believe it or not this same product currently being ordered in 15 different coil sizes, each change in dimension means stopping the cabling machines, removing the coil head and installing a different head, this means unproductive down time, set-up charges—higher costs.

★ ★ ★

**This** lack of standardization has an ultimate effect on our ability to service our customers. Today as never before, we are requested to ship immediately from stock. You can imagine that with this varied type and size of package we are forced to carry larger stock, provide larger warehouses, thus, higher costs and bigger headaches all

around.

★ ★ ★

I think you will all agree that greater standardization has become a must in our industry. Therefore, we shall advance some suggestions for improving standardization. Let's extend the use of non-returnable reels and save the manufacturer the ridiculous cost of paying return freight on empty reels and reduce our customers' accounting and storage expenses by a very considerable amount of money. Let's standardize on just a few sizes of non-returnable reels. Let's see if we can boil down from 15 to say 3 or 4 of the number of coil dimensions.

★ ★ ★

**When** a new type of construction is settled on let's throw out some of the older ones so that we're not making the same cable 32 different ways. Finally, we suggest it would be to everyone's advantage if the purchasing agents who buy electrical wire and cable items would assist in working towards better conductor and package standardization.

★ ★ ★

**This** action is needed and needed now if we are to combat inflation —and prevent material costs from getting out of bounds.

★ ★ ★

**Of** course as electrical conductor manufacturers we are non-ferrous metals people.

★ ★ ★

**The** two principal metals utilized for Electrical Conductors are of course copper and aluminum. The question is, where does each fit best into the electrical industries construction plans. In the overhead transmission of electrical energy, even with today's relatively close price of ingot copper and ingot aluminum the economics is overwhelmingly in favor of aluminum. Exceptions are certain highly corrosive areas or along the seacoast. But even in these areas improvement in methods of protecting the steel core wires have recently been developed and more improvements are on the way.

**In** the area of overhead distribution the picture is not nearly so clear. Here the basic metal price plays a far more dominant part. Here the relative scrap value must be weighed more carefully. And in this area a great many distribution wires are covered instead of bare, consequently, careful attention must be given to the possibility of moisture entering and setting up corrosive action in the aluminum conductor. Some electrical Utilities have switched to aluminum for overhead distribution. Not because of the overall economics but because of the justifiable fear that copper would continue to be scarce as it was during the decade of the last two wars. The fear no longer has any valid justification. Certainly in our lifetime, we will not again witness the copper shortage that plagued our industry during the war years.

★ ★ ★

**In** overhead distribution then selection of the most economical metal is the problem of judgment and arithmetic. It can only be answered by each separate operating company — because no two power companies have exactly the same set of conditions to start with. In the realm of insulated cables for underground installations, the engineers in our company remain convinced that the selection of copper, in all but a few isolated applications is the proper metal selection for long term conductor economics.

★ ★ ★

**Another** and often overworked factor which we believe has a pronounced bearing on conductor economics is the selection of size, particularly the size of insulated power cables. At one extreme is the too small conductor; at the other is the selection of one which is too large. The small conductor runs hot when carrying its load and energy is lost in the form of heat, consequently, dollars go down the drain. The overly large conductor is not fully utilized and thus carrying charges on the initial costs are excessive. Thus the too small conductor is penny wise and pound foolish and the too large conductor is needlessly expensive. The trick of course, is to balance carrying charges against energy cost, and thus select the proper conductor for the proper application.

★ ★ ★

**We** in the electrical industry are certain that tomorrow's anticipated loads are going to put present day consumption of electrical energy in the shade. I think you will agree then that it should certainly pay dividends to install cable today which will economically handle tomorrow's load.

★ ★ ★

**Finally,** the impact of new conductor insulating materials on conductor economics may be so revolutionary that even in the face of today's business conditions the Anaconda Wire and Cable Co. is investing substantial sums of money in basic research, research in developing the beneficial qualities of known insulating materials and research in an effort to uncover presently unknown materials which may be beneficial to the wire and cable industry in the future. We have, since the war years, seen the development of new rubber-like compounds—the silicones and the butyls in particular. In the field of plastics we have seen the development of polyethylene as an insulating material. Polyethylene has undergone many improvements which have been built into this plastic material,—improved weather ability,—improved stress environmental cracking,—improved flame resistance, just to mention a few.

★ ★ ★

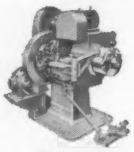
**As** insulating materials have been improved, voltage levels have been continually pushing onward and upward. Some of these steps have been made by extending present technology but each successive jump becomes increasingly difficult. At the present time the utility industry is faced with a jump into the super high-voltage cable range of 345,000 volts, such cables to be capable of carrying loads of 500 mva. It is extremely doubtful that present cables can merely be

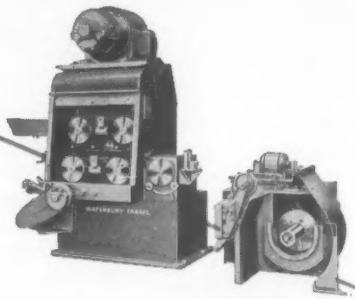
(*Please turn to page* 929)

*Over 60 Years Of Broad Experience As A . . .*

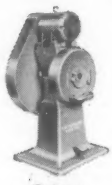
# SOURCE OF SUCCESSFUL WIRE MILL EQUIPMENT

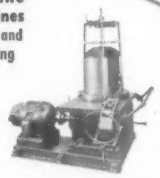
WATERBURY FARREL
FOUNDED 1851


Sizing-Up Machines with Roll Pointers and Hand Swagers


Upright Cone Wire Drawing Machines For Intermediate and Fine Wire Drawing

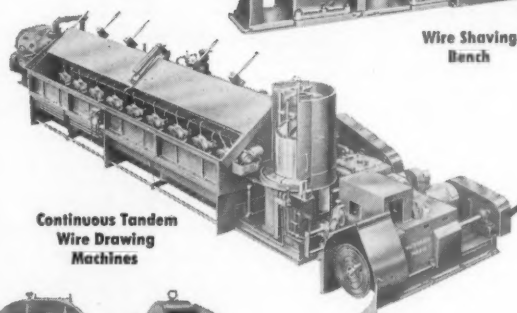
Horizontal Swagers

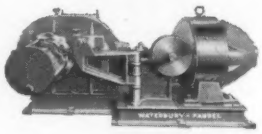

Rotary Swagers


Vertical Bull Blocks

WF-35

Wire Shaving Bench


Continuous Tandem Wire Drawing Machines


Horizontal Bull Blocks

- BULL BLOCKS
- CONTINUOUS TANDEM WIRE DRAWING MACHINES
- HAND SWAGERS
- HORIZONTAL SWAGERS
- ROLL POINTING MACHINES
- ROTARY SWAGERS
- SLEEVE WIRE DRAWING MACHINES
- SPOOLERS
- STRING-UP MACHINES
- TRAVERSING WINDERS FOR FLAT WIRE
- UPRIGHT CONE WIRE DRAWING MACHINES
- WIRE FLATTENING MILLS
- WIRE SHAVING BENCHES

*Write for free bulletins on the specific types of machines you are interested in.*

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Rolling Mill Machinery

Wire Mill Equipment

Sendzimir Mills and Other Special Machinery

# Thermalex-F

by Frank Cianchetti, Engineer
Essex Wire Corporation of California
Anaheim, California

A paper delivered at the West Coast Regional Meeting of The Wire Association at Los Angeles, California, on June 5, 1958.

**Today,** in the electrical and electronics industries are applications that require film type magnet wire that have the capability of operating at Class F 155 degrees C temperature continuously or operate at an elevated temperature for a short duration of time. Thermalex-F answers these requirements and does much more for the electrical and electronics industries.

* * *

**Thermalex - F** is a polyester formed by the condensation reactions between polybasic acids and polyhydric alcohols. In order to form high molecular weight polymers, it is necessary that the acid have at least two carboxyl groups and that there be at least two hydroxyl groups in the alcohol molecule. Condensation then produces long chain molecules. If either the acid or alcohol contains additional hydroxyl, carboxyl, or many other reactive groups, it is possible to produce a three dimensional thermosetting structure or to modify the resulting resin by adding on modifying groups. The considerable number of available polybasic acids and polyhydric alcohols allows one to achieve a considerable range of properties. The polyesters based on terephthalic and isophthalic acids are notable for their heat resistance.

* * *

**The** AIEE 57 "procedure for evaluation of thermal stability of enameled wire", which is a dielectric twist aging procedure used to compare magnet wire film insulations, indicates that Thermalex-F is capable of operating for 30,000 hours at 170 degrees C continuously, but only has a thermal classification of Class F. 155° C.

**The** 155 degrees C Class F rating for Thermalex-F is an extrapolation of accelerated life data to the temperature compared to equivalent life cycle of Formvar, which has been proven over years of experience to have a thermal stability at 105 degrees C Class A.

* * *

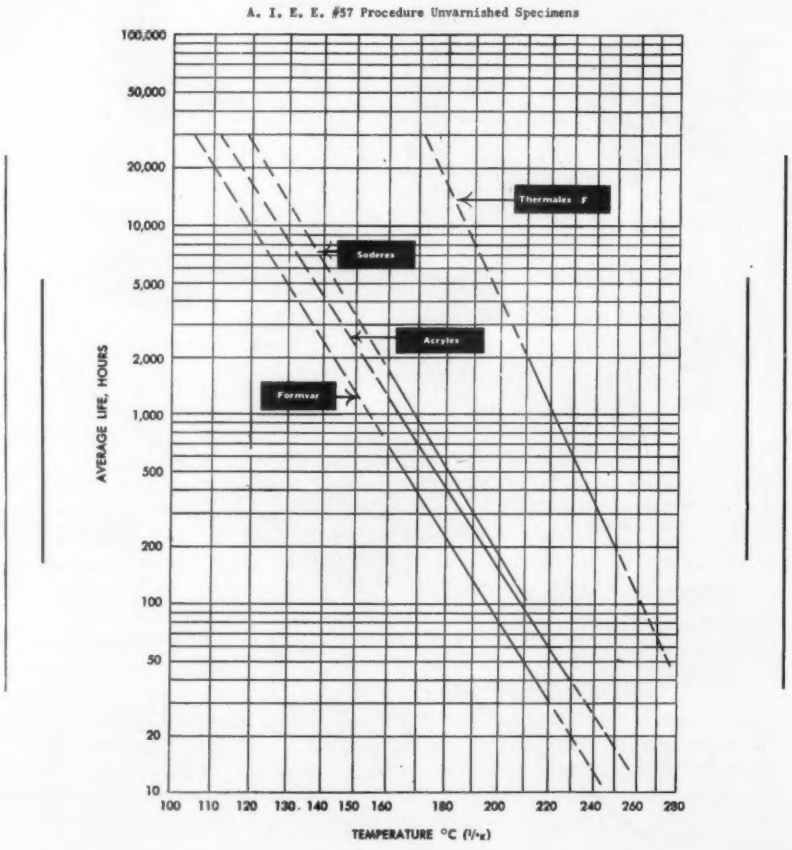
**Thermalex-F** gives the electrical and electronics industries the following advantages over Formvar.

| | Thermalex-F | Formvar |
|---|---|---|
| Dielectric Twisted Pair | 3000 V/Mil | 280 V/M |
| Thermoplastic Flow 1000 Gram Load | 290 degrees C | 200 degrees C |
| Heat Aging 168 hours at 155 degrees C | Passes | Fails |
| | 1XD | |

| Thermal Age Life AIEE Nbr 57 | | |
|---|---|---|
| 250 degrees C | 195 hrs. | 10 hrs. |
| 230 degrees C | 630 hrs. | 20 hrs. |
| 210 degrees C | 2050 hrs. | 55 hrs. |

**Thermalex-F** should be used in conjunction with Class B, Class F and better materials and should not be used at elevated temperatures with polyvinyl chlorides, saran, neoprene, or freon due to possible degradation by these chlorine containing compounds.

(*Please turn to page* 930)



# The Function of the American Iron And Steel Institute Product Manuals

by W. C. Clements
Assistant Metallurgical Engineer
Bethlehem Steel Company
Bethlehem, Pennsylvania

A discussion of the AISI Manuals delivered at the West Coast Regional Meeting of The Wire Association on June 5, 1958, in Los Angeles, California.

**Thank** you, Mr. Chairman, and good afternoon, members of The Wire Association and friends. It is indeed a great pleasure to be here on the West Coast and to participate in this meeting of The Wire Association. It is particularly gratifying for me to meet so many new friends and renew many former acquaintances.

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**Since** our program is rapidly moving along, I shall immediately proceed with the task at hand, namely, an attempt to explain or describe the functions or purposes of the Steel Product Manuals as developed by the Product Technical Committees of the American Iron and Steel Institute. However, this is a very broad field and certainly cannot be covered fully in the time allotted.

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**We** shall confine our discussion to the three product manuals relating to rods and wire which are of paramount interest to our group assembled here today. First, we would like to tell you that there are 18 Product Technical Committees, and these committees have prepared and developed a total of 22 product manuals covering the major products produced by the steel industry.

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**The** three product manuals dealing with wire or wire rods are (1) Wire and Rods, Carbon Steel, issued May 1957, (2) Alloy Steel Wire, issued May 1958, (3) Carbon Steel Flat Wire, to be issued later this year.

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**As** a preface or foreword, it is the purpose of the Steel Products Manuals to make available to purchasers, producers, consumers, and all others interested, information concerning the major steel products.

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**The** information contained essentially represents the manufacturing practices of the steel producers which have been reported to the American Iron and Steel Institute, and related scientific and technical information which has been obtained from other sources as later described. In turn, those practices evolve from the utilization of available raw materials and manufacturing methods to produce steel products to meet the requirements of purchasers' specifications and standards. The latter comprise specifications and standards of individual purchasers, consuming industries, and standardization or specification-writing bodies, including the United States Government.

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**Although** the Institute is not a specification-writing body, it participates on a cooperative basis with standardization or specification-writing bodies in the preparation of standards and specifications. The results of such cooperation are ordinarily identified by the name of the body, or some branch of the Government as, for example, ASTM Standard Specifications A 82; API Standard 9A or Federal Specification QQ-W-461. The technical aspects of standards and specifications are quite prominent throughout the manuals.

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**Some** of the numbered grades of steel are identified as AISI Standard Steels. They are standards which embrace only the chemical composition ranges and limits of such grades, and, when appropriate, the steel making process. The history of such grade numbers can be traced from the standardization efforts of the Automobile Manufacturing Association early in this century to the present cooperative work of the Society of Automotive Engineers and the Institute. Other bodies, including the United States Government, have contributed to the information on properties and uses of steel products which has aided the establishing of numbered grades as standards. Other individual consumers and engineers have, by their advice and recommendations, participated in the evolution of AISI Standard Steels.

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**Significant** information on the fabrication and performance of steel products furnished by consumers is given in the manual. In addition, scientific and technological developments in raw material utilization, manufacturing processes and new steel products are also included. Many of those developments stem from research sponsored or conducted by steel producers, universities, industrial research organizations, engineering societies and the Institute. Some of the foregoing research has been published separately by the Institute in Contributions to the Metallurgy of Steel, e.g. "Selection and Conservation of Alloying Elements Used in Steel."

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**The** various sections of the manual concern primarily the manufacturing and testing of steel products, product properties and uses, commodity descriptions, di-

mensional tolerances, weight tolerances, inspection, sampling, chemical analysis and standards and specifications which are pertinent to the identified steel product.

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**The** manual also contains descriptions of technological terms which have been developed in the manufacture and use of iron and steel. The various sections of the manual are revised from time to time, and other sections may be issued as they become necessary.

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**The** approach used by the Technical Committee on Rods and Wire in preparing these manuals is based primarily upon the metallurgical and manufacturing aspects as related to the commodity idea or description of as many individual rod and wire products as possible. Of course, it is practically impossible to describe every product or end use for which each type of wire may be used. However, I think you will find that we have made a good start in describing the fundamental or basic commodities.

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**In** addition to this phase you will find under Part 1, Metallurgical Aspects, a concise description of both alloy and carbon steel. Also included is a description of the steel ingot and possibly the best obtainable definition of the various types of steel, e.g. killed steels, semi-killed steels, capped steels, and rimmed steels, as well as an indication of where the various types of steels will function best in the many specific commodities produced from rods and wire.

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**At** this point we should probably define just what is meant by the term commodity.

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**When** we think of rods and wire as a commodity, we primarily think of the exact end use to which these materials will be put, that is, all the information necessary and relevant to the conversion and end use of the final product. This is quite essential if we in the Steel Industry are going to do our part in providing our consumers with the proper type of semi-finished material. Naturally, we can produce both rods and wire which might be used for many end uses, but in most instances I think it will be extremely difficult for us to determine exactly what you have in mind unless we are advised in some respect as to just how you were attempting to use the rods or wire as we produce them.

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**Practically** all of the steel which is supplied in the form of rods and wire has been, as nearly as possible, specifically planned and produced, based upon the knowledge for the exact end use. This information has been supplied by our customers or obtained and accumulated by experience over years of producing various or similar items.

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**The** commodity concept is not unique, nor is its use alone the brainchild of the American Iron and Steel Institute Product Committees, because this same idea or terminology is used in the preparation and the work done by the Fine and Specialty Wire Association. This Association has a very excellent manual on wire and we can highly recommend it to you. In many cases their definitions or commodity descriptions are practically identical with those used in the AISI Steel Products Manuals for rod and wire products.

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**In** order to illustrate the point at hand we might select a few of the basic descriptions found in the Steel Products Manuals as applied to rods and wire and discuss them very briefly, e.g. Industrial Quality Wire; and Specification Wire. Here are two examples representative of a broad classification of wires from a standpoint of general usage, but to be more specific we should refer you to such commodity classifications as: Heading, Forging and Rolled Threading Wires, or Upholstery Spring Wire, and Rope Wire. Descriptions of all these commodity wires are found in the Steel Products Manual, Wire and Rods, Carbon Steel. Similar examples of commodity descriptions may be found in the Alloy Wire Manual, and the Carbon Steel Flat Wire Manual for the products covered by these manuals.

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**A** brief review of the various types of steel is probably in order at this point, and we would say that all alloy steel used for wire or rod purposes is of the killed hot-top type, as well as the higher carbon plain carbon steel, e.g. .35 carbon and over. The lower carbon grades of steel, when used for rod and wire commodities or products, may be produced from rimmed, capped or semi-killed steel, with the greatest predominance in the use of the rimmed or capped type of steel. Of course, the specific end use of the product dictates the type of steel that may be used with the greatest success. We do not mean to imply that for some purposes low carbon rod and wire steels may not be produced as killed or semi-killed steels, dependent upon the exact end use.

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**In** concluding, we would express an opinion that the Steel Products Manuals contain the most concise, factual up-to-date information covering the production and use of rod and wire products, that is published. Furthermore, these manuals are continually under revision to present to the consumer the most modern advances in technology used in the art and science of this industry.

## Discussion

**Mr. Wilson:** Does anyone have any questions they would like to ask Mr. Clements?

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**Member:** It might be well to let it be known to those that are not necessarily in the wire business where these manuals can be obtained. It might be of some interest to many of those present.

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**Mr. Wilson:** If anyone would like a manual they can either call or write to the Bethlehem Steel Company or U. S. Steel and we will be more than glad to mail them to you. In fact, I planned on having

(*Please turn to page* 921)

# Rod Packaging

by J. S. Laver
Superintendent, Production Scheduling
Wire, Wire Products & Screw Division
Steel Company of Canada Limited
Hamilton, Ont., Canada

A paper presented by the author at the Buffalo Regional Meeting of The Wire Association at Buffalo, N. Y., on May 1, 1958.

**About** one year ago, I spoke to this assembly in Hamilton on the success we had had in developing a unitized package of wire rods. Experimentally, we had produced a very compact bundle. On a volume basis a large number of good, but not completely compacted bundles had been produced. Some of you may have seen these piled in our Parkdale Works storage in Hamilton. At that time, completely compacted bundles had not been made on a production basis, nor had we had too much experience in piling the bundles. In other words, we had successfully made bricks, but had not yet built houses with them. Consequently, I was cautious when making estimates of savings in space and handling.

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**Since** then, more than 200,000 tons of rods have been packaged. The bundles handle well; bands do not break and they pile better and higher than expected.

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**This,** then, has made it possible for us to use a larger part of the potential cubic capacity of the warehouse. Piling height is limited by crane clearance only.

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**A** space control program has been designed to assure effective utilization of available space. The net usable cube (allocated floor area x height under crane) was determined and converted to possible tons of compact bundles. The actual inventory at regular intervals is recorded and becomes an occupancy pattern which can be used as a basis for further improvements.

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**Last** year I think I stated the capacity of the Parkdale storage as 8,500 tons. This has now been increased to 12,500 tons normal and 15,000 tons or more at peak periods. I should probably point out that this building is also used for other purposes and that actual floor area on which rods are piled amounts to 40,000 sq. ft. including all aisles. The balance is allocated to rail sidings, rod conveyors, shipping docks, and a rod patenting furnace.

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**Because** of the high tonnages moved through this warehouse each month, it was necessary to give major consideration to crane travel. For this reason, we have for the time being at least, avoided any binning or stacking methods that would increase the travel distance or reduce the crane load. Our biggest problem, as might be expected, results from the need for segregation and accessibility. How we solved this, can best be explained by a series of diagrams. Before describing these, let me briefly explain the package itself.

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**The** bundle contains ten 400 pound coils. It is approximately 48″ in length and 42″ in diameter. It weighs two tons.

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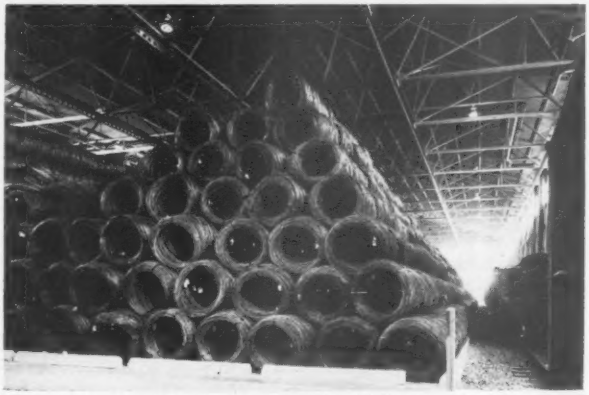
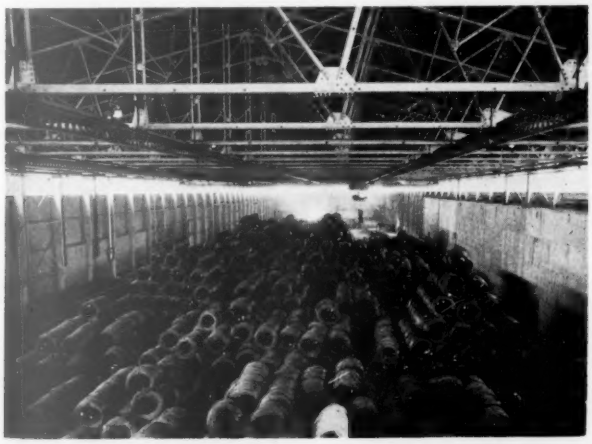
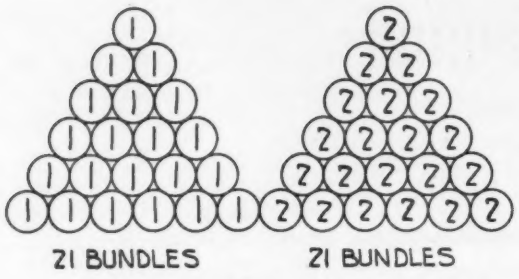
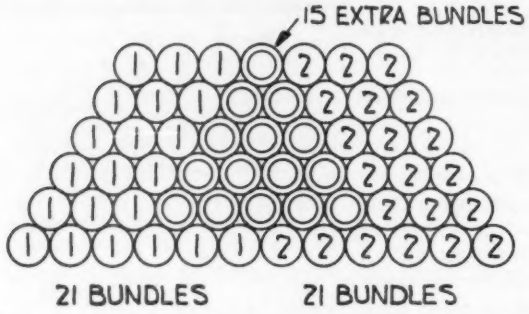
**In** forming the bundle, 50 tons of pressure is applied at specific points at the ends and two bands only are used to tie the coils together. Recently I have seen bundles tied with three and four bands. They were not compact or rigid bundles. They cost as much





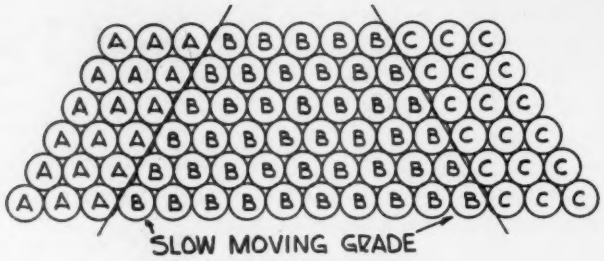
Above—View of rods in storage at Parkdale Works. * * * * *
Right—Another view looking down on the rod bundles in storage. * *




DOUBLE PYRAMID PILING INCREASES FLOOR LOAD BY 37%

Figure 1



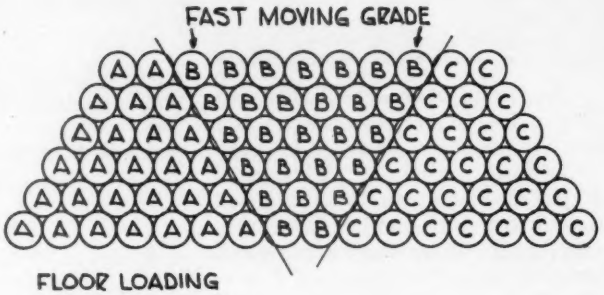




Figure 2

to produce (or more) but do not pile or handle well. I would like to say again that only **compact** bundles are economically sound. Partially compacted bundles do not handle well nor pile properly, and therefore, many of the advantages are lost.

★ ★ ★

**The** bundles packaged in Hamilton are rigidly tied and this prevents the bands from slipping, since they are affixed at the shortest point on the side of the bundle. Bands are therefore not subjected to excessive strain and undoubtedly this is the reason why bands **do not break.**

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**Piles** do not sag. Bundles have been piled seven and eight high although a maximum of six high has been used for all floor loading plans and calculations.

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**Even** though we have had good bundles for some time, it has only recently become apparent that there are additional advantages to be gained from this package. It is no longer necessary to dump rods into bins or associate them with piles of sand, ore, limestone or scrap. Rods can now be piled as neatly as coils of strip or drums of oil.

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**Naturally,** pyramidal patterns were the first used and doubled the quantity in any of our storage areas. We are now reaching out for much greater loading, by adopting a combination of some of the methods I am about to describe. Refer to charts or figures.

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**Figure 1.** Shows comparison of ordinary pyramid piling versus double pyramid.

★ ★ ★

**Figure 2.** Outlines a method that permits floor loadings from 1000-1335# per square foot.

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**Figure 3.** Shows how floor loading can be increased by 60% by loading common fast moving grades temporarily on top of slow sizes.

★ ★ ★

It has not been possible to do more than indicate a few of the applications. It is our hope that these may have been of assistance to you and we would be pleased to supply more detailed information if requested.

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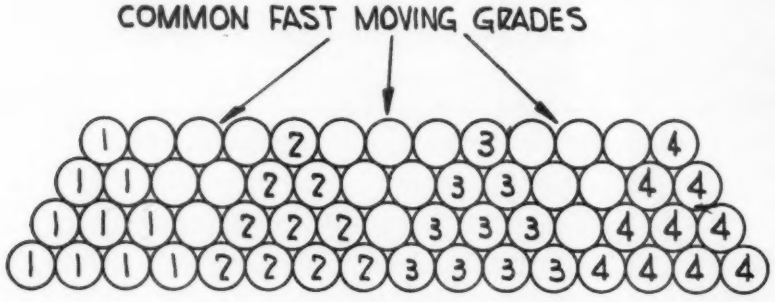
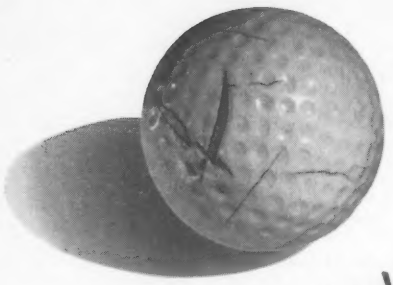
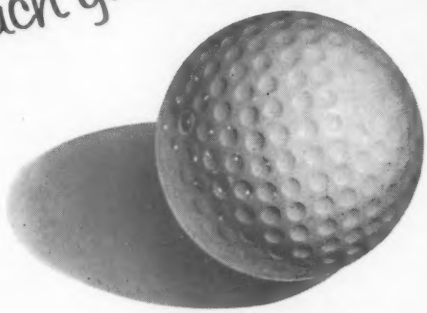



USING VALLEY'S INCREASES FLOOR LOADING BY 60%

Figure 3



*If you were a golf pro, which golf ball would you use?*



*An $8,000 handful of pure, virgin diamond bort ready for crushing and grading to produce ELGIN Diamond.*

You'd use the new one of course. You couldn't afford to risk your winnings on the erratic flight of an old ball—just for a small savings.

It's the same with diamond abrasives. You can't afford to risk your profit on the performance of reclaimed diamond. It's too big a gamble for a small economy. Play to win with dependable diamond—virgin diamond. **ALL ELGIN DIAMOND is virgin diamond . . . say ELGIN and be sure!**

**ABRASIVES DIVISION**
**Department G**

**ELGIN NATIONAL WATCH COMPANY**

**ELGIN, ILLINOIS**

# Automatic Preparation of Stranded Cable For Terminations

by

W. Scott
Section Manager

and

J. L. Harper
Materials Engineer

Westinghouse Electric Corporation
Sharon, Pennsylvania

This paper was presented at the Buffalo Regional Meeting of The Wire Association on May 1, 1958, in Buffalo, N. Y.

**In** the manufacture of small breakers with varied Kva ratings, a large number of connecting shunts are required. It is desirable that these shunts have maximum flexibility and this would indicate the necessity of using fine stranded wire. In order to use copper most effectively, the shunt size (current carrying capacity or cross-sectional area) must be varied with the magnitude of the current it is designed to carry. If flat braided cable were used, it would be necessary to stock a large number of sizes. We are able to cover our requirements by using round stranded cable with two wire sizes and thereby minimize shunt stock by stocking 1, 2, and 3-cable shunts. Where additional cross-section is required, we add one of the basic shunts making a stack in final assembly. Raw material costs are also lower since cable of comparable current carrying capacity is less than flat braided cable. The use of cable for this type of application presents a problem in that if the leads are cut directly to length, considerable fraying will result.

★ ★ ★

**When** manufacture was started on this type of operation, soft solder was used to prevent frayed ends. This work introduced an extra operation and where brazing was desired, the solder interfered with the making of a good braze. If the wires were merely cut and no attempt made to protect the ends, the appearance would be bad and considerable time would be required to effect a workmanlike job. Since the parts were all handled one piece at a time, early efforts were in the direction of minimizing the handling time. This resulted in the brazing of various terminations to the wire directly in continuous length and separating at the proper point. Where separations were required, two parts would be placed in very close proximity. When parting such assemblies, if the space between was left long enough to make room for a suitable cut-off mechanism, then there would be overhang after cutting and the length to be joined became excessive for the process. This type of assembly was made by joining two terminations and the wire simultaneously, in effect making two brazes at one time. The entire operation was suited to fixturing which increased the uniformity of parts and minimized the hand operations. The main difficulty results from a complexity of parts and their location of attachment which would not always lend itself to the joining of two terminations in close proximity.

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**Therefore,** it was found necessary to cut cable to length and some means to prevent fraying was required. It is believed that such a method has been developed. The manufacture of flexible shunts from round cable has been separated from the other operations. This approach makes it necessary to place the shunts directly on the parts one piece at a time, but permits the manufacture of shunts in varying lengths and number of cables to a shunt on automatic equipment requiring a minimum of labor. The overall problem of manufacture of breaker parts was further complicated by the fact that there were many thousands of such cables used in a variety of lengths and number of cables to make a particular shunt. This new approach has limited the manufacture to six basic shunts. In most cases, the shunts are subsequently joined to various terminations carrying contacts or other current carrying members in our own factory; however, some end terminations are later joined by the ultimate customer.

★ ★ ★

**The** equipment developed for making these leads is built around a standard 75 Kva pedestal type spot welder. A composite electrode is made by cutting down a standard spot welding electrode to within 1/8" of the water chamber and brazing on a molybdenum tip. These tips are then contoured to the cable size to be brazed. The contour of the cavity of the tip is slightly under the radius of the cable in height but kept to the same diameter in width. On multiple cable shunts, a flat electrode is used on top and the bottom only is contoured. The edges are well rounded and the ends are generously flared so that no sharp lines will develop in the cable. This cavity must of necessity be considerably smaller than the physical wire dimension since there is a great deal of compacting of the individual strands when it is brazed. The compacting is also necessary to prevent arcing at the electrodes.

★ ★ ★

**The** solidifier was developed around the operation of an air cylinder that actuates the component parts and causes the cable

to progress through the equipment. The entire assembly is mounted on the standard 3″ diameter bottom horn of the spot welder and insulated with a micarta tube. In any brazing operation using a controlled time cycle, it is mandatory that welding conditions of tip contact area and resistance be maintained constantly. In order to do this, the first step is to establish close control of the electrode contacting area by machining as wear or cracking occurs. The next point of control is to make certain that the cable being brazed is fed constantly in the same relative position. This is accomplished by the use of slotted brass guide blocks with micarta inserts as shown on the right of Figure 1.

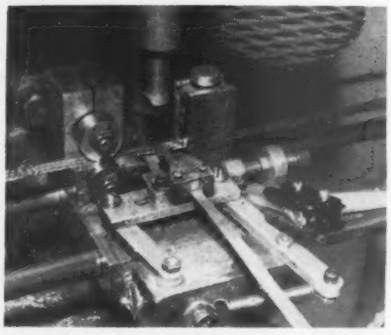

Fig. 1—Brazing agent feeder and rotary shear.

**This** block is made adjustable so that it can accommodate multi-strand and also single-strand cable. Sufficient clearance must be provided but not to the point where the cable is permitted to wander or cross over. At this point the level and uniformity of the shunt is established. The cable moves from right to left as shown on Figure 1. As the cable crosses the molybdenum electrodes, the brazing agent is fed across the cables and in the proper sequence the electrodes close, current flows through the welding machine circuit, and the heat thus generated in the molybdenum electrodes serves to bond the brazing agent to the cable sufficiently to hold the cable together. At this point, it is desired merely to provide sufficient heat to compact the cable and obtain bonding between the cable and the brazing agent, to prevent the separation of the cable, and provide brazing agent for subsequent brazing operations. It is not desired to completely fuse the brazing agent at this stage. At the completion of the heating cycle, the electrodes separate and the cable moves to the left, carrying the supply of brazing agent with it until it reaches the set of knives to the left of the electrode. As the cable proceeds, the brazing agent is cut off by passing through the knives, leaving the extension of the brazing agent the proper length to just cover the width of the cable or cable assembly, so that when it returns to its position under the electrode, sufficient brazing agent is available to cover the cables in the same manner as when we started the brazing operation. This entire operation is accomplished by a spring loaded parallelogram shown in the fore-ground of Figure 1. On the left of Figure 2, a completed shunt is on the slide about to be cut and discharged down the slide.

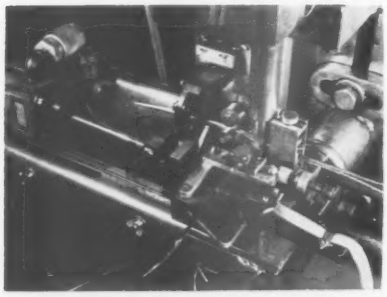

Fig. 2—Electrodes closed for heating cycle; also, Clamp and cable cut-off shear assembly. * *

**In** the case of double-strand shunts, the electrodes are in the closed position during the heating cycle. (Figure 2). It will be noted to the left of the brazing agent cut-off shears the jaws of a small clamp and shear through which the cable passes. This device is in the extreme open position permitting the cable to move freely through it. At the completion of the heating cycle, the clamp will close holding the wire firmly at the same time the shunt will be cut on the left side of the clamp, splitting the brazing agent so that one half remains on each end of the cut shunts. Adjustments can be made so that this will always occur. The clamp then remains closed and the air cylinder controlling the clamp and shear head is actuated pulling the wire through the previously described mechanism.

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**Figure 3** shows another view of this equipment with the electrodes closed and the position of the cable

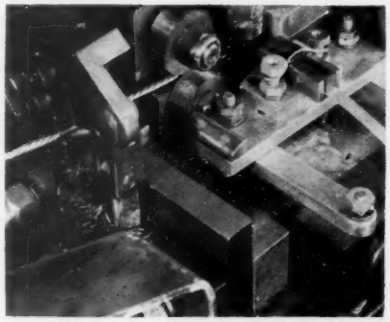


Fig. 3—Brazing agent feeder, clamp and cable cut-off shear from front side. * * * *

at cut-off. When the air cylinder reaches the full extent of its travel, the next braze has been completed, sufficient cable has been pulled into the equipment, and the air cylinder returns the shear clamp to the position shown and the entire cycle described is then repeated. The wire de-reeler merely consists of a stand to support three reels of wire (Figure 4) required

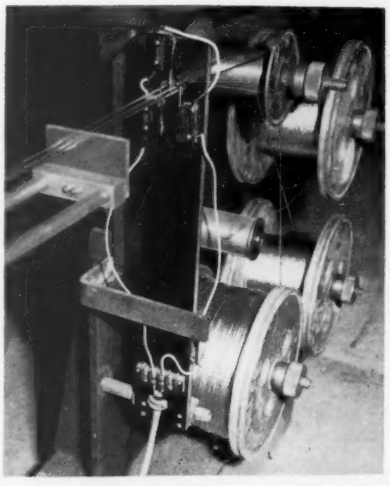


Fig. 4—Cable de-reeler showing location of micro-switches and arrangement to maintain level. *

to supply the shunts being made. The friction of unreeling should be kept to a minimum but should be sufficiently high to maintain the cable straight and level as it enters the electrodes. In order to establish uniformity, it is desirable to feed the cable through small diameter openings. The openings should be

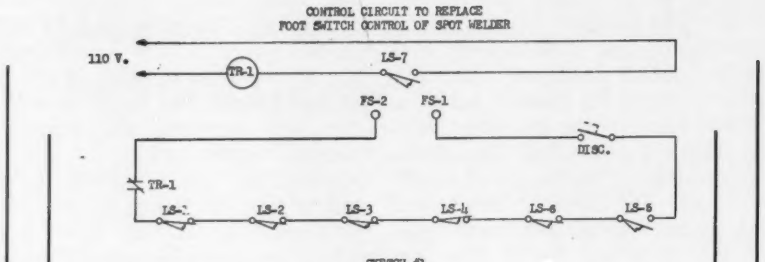
large enough to accept the largest diameter cable being used. In order to make certain that the cable is fed in proper alignment and to stop the operation when the cable runs out or when any interruption of the de-reeling operation might occur, micro-switches are provided as shown in Figure 4. The micro-switches are connected in series with the control and will stop the operation when indicated. It will also be noticed on the brazing agent feeder that the parallelogram must return to the position where the brazing agent is over the electrodes in order to close a micro-switch at this position. This switch is also in series with the control.

★ ★ ★

**The** welding machine uses a standard NEMA N3H control cabinet with a 3B timer. In addition, micro-switches (Sketch #1) are added in series with the normal foot switch control. The entire operation is actuated by the use of an air cylinder which serves to pull the shear and clamping mechanism on the ways provided and as shown on the left of Figure 1. The air supply is taken directly from the air that supplies the welding machine and directed to function as required in harmony with the welder operation. (Sketch #2). This automatically serves to synchronize the two operations. When the welder is in the welding position, the air clamp should be in the extended position and open; when the welder is at the top of its stroke, the shear and clamp will be in the contracted position and closed.

★ ★ ★

**The** heating current varies with the shunt size but will be approximately 12,000 amperes at 800 pounds electrode force, and 30 cycles. The brazing material used for this operation is 5-mil Sil Fos,




SKETCH #1

**LS-1, LS-2, LS-3—Normally open limit switches, held closed by feeder cables.**

**LS-4—Normally closed limit switch, opened when any of three feeder cables become snarled.**

**LS-6—Normally open limit switch, held closed by cable in clamp.**

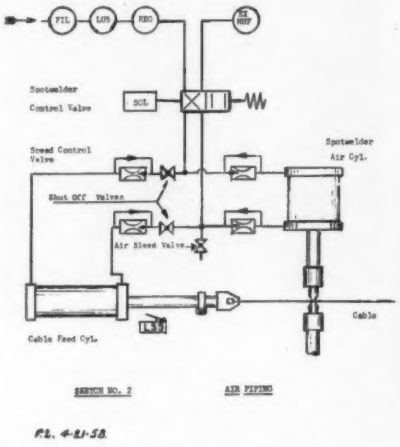
**LS-5—Normally open limit switch, closed by cable positioner at beginning of each cycle. Ref. to Sketch No. 2.**

**LS-7—Normally open limit switch, closed during each cycle by brazing agent positioner.**

**TR-1—Timer, with time delay variable from 3-100 cycles.**

**FS-1, FS-2—Terminals on welder, originally intended for foot switch.**

¼" wide. An unfused portion on the cables is desirable so that it may be utilized as the joining medium when the parts are sub-




SKETCH NO. 2 AIR PIPING

FL. 4-21-58

sequently brazed to the proper end termination. This operation is performed individually and utilizes the same principle in that blocks of molybdenum are used on the electrodes, but in this case it is only necessary to have the edges well rounded so that the cable will not be notched. Since the cable is already compacted, it presents a flat surface and does not need the extreme care in the preparation of a contoured electrode.

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**When** the only objective is to prevent frayed ends, it is found unnecessary to add brazing agent; otherwise, the same procedure is followed. Figure 5 shows an ar-

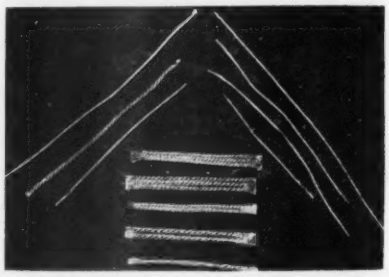

**Fig. 5—Arrangement of shunts with and without brazing agent.**

rangement of present production. When making three cable shunts of 3-¼" length, it is possible to complete 1800 pieces per hour. As a result of this effort, subsequent brazing operations have been simplified with a resulting improvement in quality and appearance.


# THE WIRE ASSOCIATION

**Invites wire men to join the organization and participate in its activities.**

***Write for a booklet on what it is and how it functions to***

**RICHARD E. BROWN**
**Executive Secretary**

**453 MAIN STREET** **STAMFORD, CONN.**

# New Radiant Tube Furnaces for Processing In Galvanizing and Patenting Lines

by William D. Bawden
Wire Mill Consultant
Lee Wilson Engineering Company
Cleveland, Ohio

**The** operation and design of galvanizing lines are undoubtedly quite familiar to all present; however, to recapitulate, most galvanizing lines consists of a series of pay-off reels, lead annealing furnaces, a water quench, cleaning facilities, including a flux tank, the spelter pan, wipes, and the take-up frames.

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**As** the process of hot dip galvanizing is a method of coating wire with zinc to provide a corrosion resistant surface, the heart of all galvanizing systems must of necessity be the spelter pan.

★ ★ ★

**A** properly applied coating consists of three binding layers. The layer next to the base metal is high in iron and low in zinc. The second, or center layer, is lower in iron and higher in zinc. While the layer farthest from the base metal, or the outside coating is very low in iron and high in zinc.

★ ★ ★

**The** equipment located in the line prior to the spelter pan is used to prepare the surface of the wire for a satisfactory bond between the base metal and the zinc.

★ ★ ★

**As** zinc is higher in the electrochemical series than steel or iron, the bond between the two metals is from the iron to the zinc in preference to the zinc to the iron.

★ ★ ★

**Because** the iron, in essence, dissolves into the zinc, there is considerable pickup of iron in the spelter pan. This is called dross and forms in the bottom area of the spelter pan. This formation of dross makes it highly important that the immersion time of the wire in the zinc bath is adequate for heating the steel to a bonding temperature, and yet, is not so excessive as to waste good zinc by increasing the iron content in the bath. With this in mind, the most satisfactory application of heat to a spelter pan would be heating units arranged to give a minimum of temperature difference from end to end of the spelter pan and a minimum of temperature difference between the combustion area of the furnace and the spelter inside the pan.

William D. Bawden

**Mr. Bawden graduated from Wesleyan University in 1929 with a B.A. degree and took post-graduate work in Metallurgy and management at Lewis Institute and Illinois Institute of Technology from 1938 through 1941. He was a technical apprentice at the Trenton Works of American Steel and Wire from 1933 to 1936, inspector at Republic Steel's Grand Crossing Works from 1936 to 1938, General Superintendent at Reynolds Wire from 1938 to 1942, and then joined Gilbert and Bennett, where he was works manager when he resigned in 1957 to become a Wire Mill Consultant.**

**This paper was presented at the Buffalo Regional Meeting of The Wire Association on May 1, 1958, in Buffalo, N. Y.**

★ ★ ★

**The** most practical application of burners to a spelter pan, for this type of temperature differential is by radiant tube heating. This type of furnace setting is shown in Figure 1. Also shown in this picture is the method of using the exhaust gases for pre-heating the wire entering the spelter pan.

★ ★ ★

**Figure** 2 is a plan view and side elevation of the wire galvanizing furnace, using the radiant elbow heater tubes and burners. The heater tubes are arranged to obtain a minimum temperature differential along the surface of the exposed pan area. The preheat chamber is also shown in this drawing.

★ ★ ★

**Figure** 3 is the cross section of a galvanizing furnace. The heater tubes are arranged to be more effective in the top two-thirds section of the spelter pan. This allows the minimum dross formation in the bottom area of the pan. It also shows the simplicity of construction in the furnace wall and the practicability of using an insulating material in preference to a hard surface firebrick, thus increasing insulation efficiency and cutting down the thickness of insulation required.

★ ★ ★

**Figure** 4 shows a cross section of a galvanizing furnace with the insulation required for the radiant elbow firing and the insulation required for direct firing. It is evident in this plan that the direct firing installation requires approximately two feet more width per

furnace unit than the radiant elbow firing.

★ ★ ★

**Another** feature of the radiant elbow furnace is the even temperature distribution within the combustion chamber. Temperature as low as 1350°F., and not exceeding 1450°F. are normal in this furnace. As a comparison temperatures ranging from 1350°F. to 1650°F. are not uncommon in the other unit shown, with localized hot spots as high as 2300°F. evident in the burner area.

★ ★ ★

**The** basic principal of galvanizing requires:

1. **The proper amount of metal in the pan for a given production.**
2. **The thickness of the pan in proportion to the amount of zinc in the pan.**
3. **The B.T.U. input through a square foot of exposed pot surface area be maintained, well within safe operating range of 10,000 B.T.U. per square foot per hour.**

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**All** three of these principal requirements are maintained well within safe operating ranges.

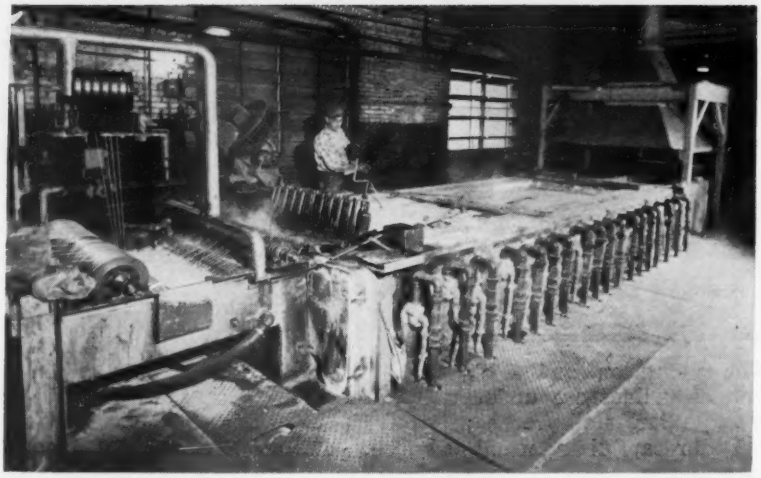

Figure 1—View of spelter pan using radiant tube heating.

★ ★ ★

**Combustion** is completed within the radiant elbows, consequently no flame impingement is possible on the pan surface. The heater tubes are also arranged so the exhaust gas flow from the burners to the flues will apply convection heat to the exposed pan surfaces. It is also possible with this arrangement to have a pre-heat area at the entrance end of the spelter pan, by using the exhaust gases to pre-heat the entering wire, increasing furnace efficiency and preventing the possibility of moisture contaminants on the wire entering the spelter pan.

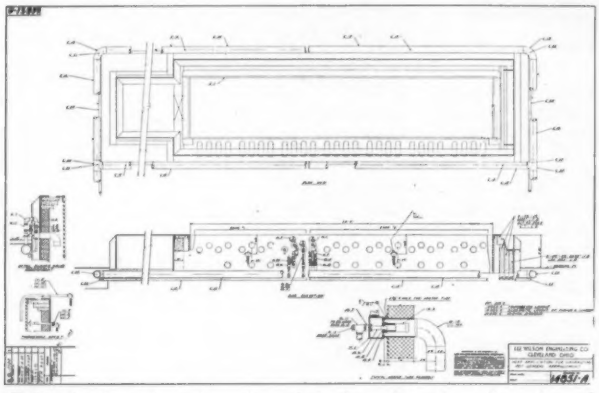

Figure 2

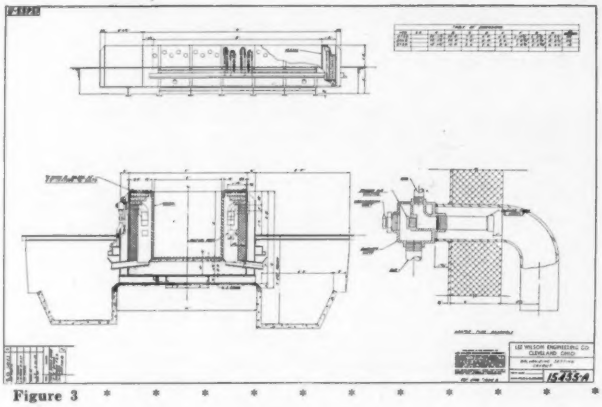

Figure 3

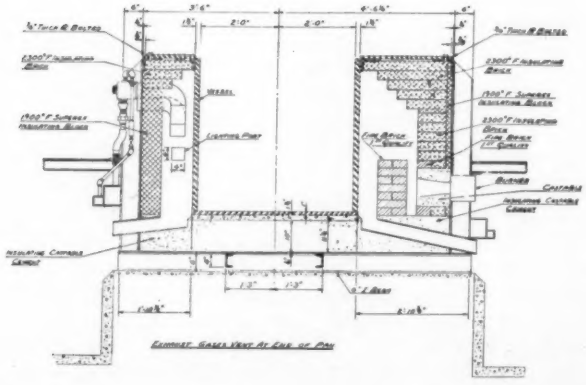

Figure 4

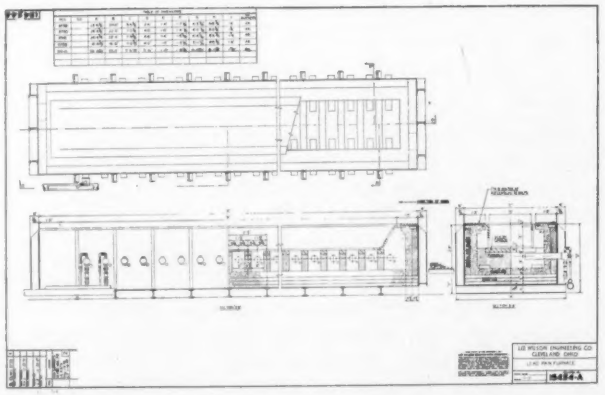

Figure 5 (upper)

Figure 6 (lower)

**The** combustion system and temperature control on this furnace is the proportioning type and has a turndown ratio of 10 to 1. The burners are the dual pressure nozzle mix type which eliminates any possibility of backfire regardless of the type of fuel being used. This burner system is the same as is used extensively on the tube-fired annealing furnaces.

★ ★ ★

**The** use of radiant elbow burners as a method of firing galvanizing furnaces is not a new innovation, this type of burner has been in continuous operation since as early as 1944.

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**The** furnaces shown in the previous slides are a completely assembled unit ready for shipment.

★ ★ ★

As previously mentioned, the initial equipment in a galvanizing line is the lead annealing furnace. This unit can be set up as a single furnace or a series of two furnaces. The number of furnaces required depends on the production required and the temperature desired.

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**Figure** 5 shows a side view of such a furnace and the application of the radiant tube burner for heating the lead pans. Also shown is the method of supporting the lead on brick piers, topped by carborundum brick for better distribution of heat to the bottom of the pan.

★ ★ ★

**Figure** 6 is a section view of the lead furnace. In this application a straight radiant tube is used as a heating medium. This tube is fired to apply heat to the bottom and the side of the lead pan, allowing a greater heating area coverage of the lead pan proper.

★ ★ ★

**Figure** 7 shows the comparison of the insulation required with tube fired and direct fired furnaces. Approximately 12 to 18 inches greater width is required in the direct fired furnaces, over the radiant tube fired unit.

★ ★ ★

**This** type of insulation and combustion application makes is possible to construct the lead furnaces as a complete unit for shipping purposes.

★ ★ ★

**The** heater tubes and the combustion system are so arranged to complete combustion within the burner tube, again eliminating the possibility of flame impingement on the surface of the lead pans. Convection gas flows of the exhaust gases are utilized, wiping the side area of the lead pans for greater heat transfer. The exhaust ducts on these furnaces can be arranged to expell at the end of the furnaces or be vented through flues to an outside area. The combustion and temperature control is again, the proportioning type and has a turndown ratio of 10 to 1.

★ ★ ★

**The** terminology "Patenting" is used only in the wire industry. Patenting is a heat treatment applied to rod and wire having a carbon content of 0.25% and higher. The object of patenting is to obtain a structure which combines high tensile strength with high ductility and thus imparts to the wire the ability to withstand hard drafting to produce the desired finished sizes. The finished wire possesses a combination of high tensile strength and good toughness.

★ ★ ★

**Patenting** is a continuous process and consists of heating the material in strand form to a point above the upper critical temperature; then cooling through the critical temperature at a comparatively rapid rate to a predetermined temperature level, at which the transformation will yield the desired microstructure and mechanical properties.

★ ★ ★

**There** are three types of patenting furnaces in use today.

1. **Lead Patenting—This system utilizes lead bath furnaces for heating the rod or wire above the critical temperature and a lead quench furnace for obtaining final structures.**
2. **Air Patenting—This unit consists of a horizontal muffle or open fired furnace with the wire passing through alloy tubes and quenched in air. In some instances the alloy tubes are eliminated, allowing scale formation on the wire or rod.**
3. **Metallic Hardening—This unit consists of a horizontal muffle or open fired furnace with the wire passing through alloy tubes and quenched in a lead quench furnace. There are also installations where the alloy tubes are not used on this type of furnace.**

★ ★ ★

**The** furnace featured in this paper can be used to process both

(*Please turn to page* 922)

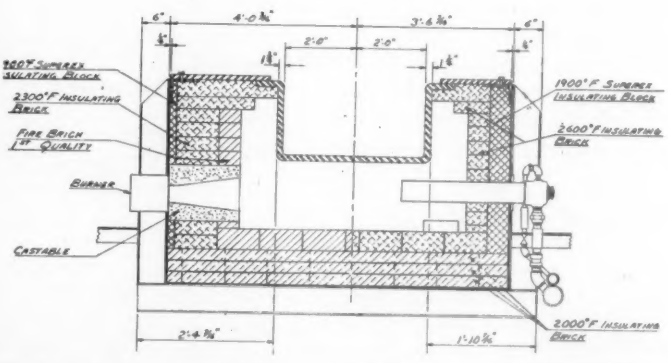



Figure 7

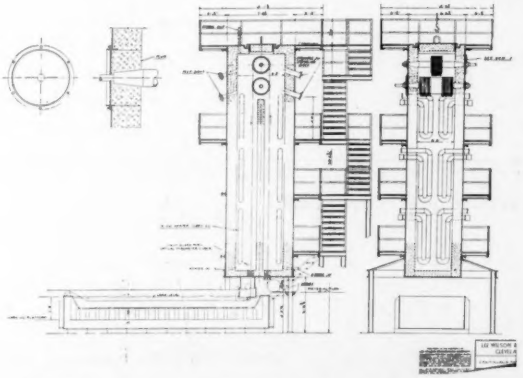


Figure 8

# *The Program of*

# THE ANNUAL CONVENTION

## • THE WIRE ASSOCIATION •

## October 13-16, 1958, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J.

All activities will be on the 13th Floor of Haddon Hall. Association Headquarters will be open on Sunday afternoon, October 12th. If you arrive early be sure to visit us there to get acquainted or to renew acquaintances.

## SCHEDULED EVENTS

**MONDAY MORNING**

9:00 A.M.—Registration Desk Opens.

10:00 A.M.—Annual Meeting of The Board of Directors of The Wire Association.

12:30 P.M.—Directors' Luncheon for Program Participants. Address of welcome by Tom M. Girdler, Jr., President.

**MONDAY AFTERNOON**

2:00 P.M.—Joint Meeting of the Ferrous and Non-Ferrous Divisions.

Symposium: Aluminum Coating of Steel Wire.
Aluminum Coated Pole Line Hardware.
Aluminum Coated Steel Wire Products.
Alumoweld Wire.
Resistance to Corrosion of Aluminum Coated Steel Wire.

**TUESDAY MORNING**

9:30 A.M.—Ferrous Division Technical Session.

Papers: The Manufacture of Welded Mesh and Some of Its Uses.
Mechanical Descaling of Wire Rod in England.
Galvanizing Wire by the Sendzimir Process.
Pressure Lubrication.

**TUESDAY AFTERNCON**

2:00 P.M.—Ferrous Division Sessions Continued.
Symposium on Shot Blast Cleaning of Rod.

Papers: Problem of Pollution of Rivers by the German Steel Industry.
An Installation for Shot Blast Cleaning of Rod.
Continuous Patenting, Cleaning and Coating of Rod. (At Leschen)
Recent Experience with Shot Blast Cleaning of Rod.
Continuous Patenting, Cleaning and Coating of Rod. (At Roebling)

**WEDNESDAY MORNING**

9:30 A.M.—Ferrous Division Sessions Continued.

Papers: Electronic Ordering System.
Experimental Prestressed Concrete Highway—an Engineering Report.
Spooling of Fine Wire.

Demonstration: Redesign and Conversion to Wire.

**TUESDAY MORNING**

9:30 A.M.—Non-Ferrous Division Technical Sessions.

Symposium: High Speed Take-Ups and Electrical Testing. This Symposium will have 10 speakers representing manufacturers of Take-Ups, mill users of Take-Ups, and mills who do electrical testing.

**TUESDAY AFTERNOON**

2:00 P.M.—

Papers: a) French Experience with All-Aluminum Alloy Conductors for Overhead Lines.
Aluminum Alloy Cables for Overhead Power Lines.
And 3 others on various phases of Aluminum Cable manufacture.

b) Preheating Conductors in Extrusion Processes by Copper Loss Method.
Temperature is a Function of Current.
Properties and Characteristics of Pro-fax—Hercules' Polypropylene.
Thermal Cracking of Polyethylene.
Recent Applications of High Density Polyethylene.
Wire Insulation of Teflon—Fluorocarbon Resin—Properties and Fabrication.

**WEDNESDAY MORNING**

9:30 A.M.—Non-Ferrous Technical Sessions Continued.

Papers: a) Polyethylene in Overhead Line Wire.
Polyethylene in Power Cables.
Historical Background on THW Cables.
Insulated Power Cables (A Japanese paper).

Papers: b) Accelerated Aging Tests in Service Performance of Neoprene Jacketed Drop Wire.
Inclined Enameling Machines for Coating Fine Wire.
Plasticized Polyvinyl Chloride for Retractable Cords.

NOTE: The letters "a" and "b" indicate simultaneously held Non-Ferrous Sessions, as time will not permit all papers to be presented in one session.

**WEDNESDAY AFTERNOON**

1:00 P.M.—The Annual Luncheon—at which merit awards, 25-Year Certificates, and the Mordica Memorial Lecture, by D. D. Buchanan, will be presented.

4:00 P.M.—The Annual Meeting of members of The Wire Association.

6:30 P.M.—Cocktail Hour preceding Stag Smoker-Dinner.

7:30 P.M.—The Stag Smoker-Dinner and Floor Show.

**THURSDAY MORNING**

Plant Inspection Tours.

8:30 A.M.—Busses leave hotel for Roebling, N. J., and Trenton, N. J., to visit the Steel Wire Mills and Electrical Wire Plants of the John A. Roebling's Sons Corp., for the Ferrous and Non-Ferrous Divisions respectively. Luncheon will be served. Arrangements made for those who do not wish to return to Atlantic City, to leave from Trenton.

The Annual Convention is open to all wire industry personnel and all are cordially invited to attend. Hotel reservation cards will be mailed to Association members. Non-members are requested to write for these cards in order to be assured of a room at Haddon Hall, our headquarters.

Without doubt, the 1958 Convention contains the finest aggregation of papers ever presented. Be sure to attend this important Convention!

MAKE YOUR RESERVATIONS TODAY.

**• THE WIRE ASSOCIATION •**

Richard E. Brown, Executive Secretary

453 MAIN STREET STAMFORD, CONN.

# Simplified Construction of Reel Capacity Charts

by William J. Owens, Jr.

Engineer—Manufacturing Standards
Wire and Cable Department
General Electric Company
Bridgeport, Connecticut

**Mill men having to do with the problem of calculating the wire capacities of reels, will find in this article a short-cut method that will save much time and mathematical figuring.**

## Conventional Method of Reel Capacity Chart Calculation

**The** conventional method of calculation of reel capacity charts from the mathematical formula:—

$$1.\ F = \frac{\pi}{12}\left\{\left[B + \left(\frac{A-2\times -B}{D}\right)\dagger D\right]\left[\frac{A-2\times -B}{2D}\right]\dagger\left[\frac{(C)\ (0.9)}{D}\right]\dagger\right\}$$

Where

- F = Feet of cable on reel
- A = Flange diameter in inches
- B = Drum diameter in inches
- C = Inside traverse in inches
- D = Diameter of cable in inches
- X = Clearance under lags in inches
- † Indicates use of the whole number only in the calculation of the previous term; i.e., drop fractions.

★ ★ ★

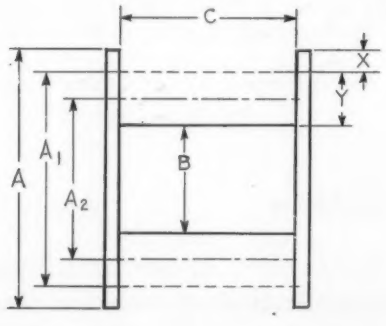
**Additional variables:—**

- $A_1$ = Flange diameter in inches minus two times the clearance under lags in inches.
- $A_2$ = Average diameter of cable turn in inches.
- Y = Depth of cable on drum in inches.

★ ★ ★

**Where** footages are computed at incremental values of wire and cable diameter proves to be a tedious and time consuming operation unless an electronic computer is available.

FIGURE 2




## Theory of the Semi-Graphical Method

**By** the use of a semi-graphical method of solution, reliable results can be obtained in a matter of a few minutes work which produces a continuous graph of footage vs. wire or cable diameter which if desired can be converted into the more usual form of an incremental chart.

★ ★ ★

**The** theory of the semi-graphical method is based on the same assumptions as the formula (1) where the number of turns per layer is calculated by the diameter of the cable in inches (D) into the traverse width in inches (C) see Figure 1.

$$(2)\ \text{Number of turns per layer} = \frac{C}{D}$$

and the number of turns in the depth is calculated by dividing the diameter of the cable in inches into the depth (Y) see Figure 1.

$$(3)\ \text{Number of turns in depth} = \frac{Y}{D}$$

where

$$(4)\ Y = \frac{A_1 - B}{2}$$

and therefore

$$(5)\ \text{Number of turns in depth} = \frac{A_1 - B}{2D} \quad \text{and}$$

$$(6)\ \text{the total turns per reel } (T) = \frac{C(A_1 - B)}{2D^2}$$

★ ★ ★

**The** average length in feet of a turn (L) is the mean diameter $A_2$ times $\frac{\pi}{12}$ (see Figure 1) where

$$(7)\ A_2 = \frac{A_1 + B}{2} \quad \text{and}$$

$$(8)\ L = \frac{\pi\,(A_1 + B)}{24}$$

★ ★ ★

**The** total footage represented is as follows:—

$$(9)\ F = T \times L$$

and

$$(10)\ F = \left[\frac{C\ (A_1 - B)}{2D^2}\right]\left[\frac{\pi\ (A_1 + B)}{24}\right]$$

$$(10)(a)\ F = \frac{\pi}{48\ D^2}\left[C\ (A_1^2 - B^2)\right]$$

★ ★ ★

**This** term

(11) $[C\ (A_1^2 - B^2)]$ = a constant for any reel size (K) and can be considered a volumetric factor for the specific reel and is computable with very little effort to determine a constant K value for that reel.

★ ★ ★

**This** makes the equation:

$$(12)\ F = K\left(\frac{\pi}{48D^2}\right)$$

Using this, a Table I can be constructed as follows for the relation of D and F and using approximately a 95% loading factor (See Table I):

TABLE I

| D | .079" | .125" | .250" | .500" | .790" | 1.120" |
|---|---|---|---|---|---|---|
| F | 10K | 4K | K | K/4 | K/10 | K/20 |

These values hold essentially true when F is more than 500 feet and are reasonably accurate down to 100 feet.

## Technique of the Semi-Graphical Method

Calculate for the specific reel using equation

$$(11)\quad K = [C\,(A_1^2 - B^2)]$$

★ ★ ★

Since the equation

$$(12)\quad F = K\left(\frac{\pi}{48D^2}\right)$$

is exponential in type, it will produce a straight line plot on log-log graph paper with a slope of minus 2.

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Starting with the value of .25 inches diameter plot on two cycle log-log paper, the value K for footage at this point. Select one or better two of the values of D vs F in the proper range from Table I and plot these values.

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Connect these points with a straight line to a range limiting the wire or cable diameter to a maximum permissible for drum diameter based on applicable standard.

★ ★ ★

This plot is a reel chart for the specific reel and may be included as a family of lines on one graph sheet for various reels in the same class.

★ ★ ★

Incremental charts can be plotted from values read from the graph.

### Example

Produce a reel chart for the following family of reels:

| A | X | B | X | C |
|---|---|---|---|---|
| 12" | X | 6" | X | 10" |
| 14" | X | 6" | X | 10" |
| 18" | X | 8" | X | 10" |
| 24" | X | 10" | X | 12" |

X = Flange clearance = 1"
Maximum diameter of cable = B/14

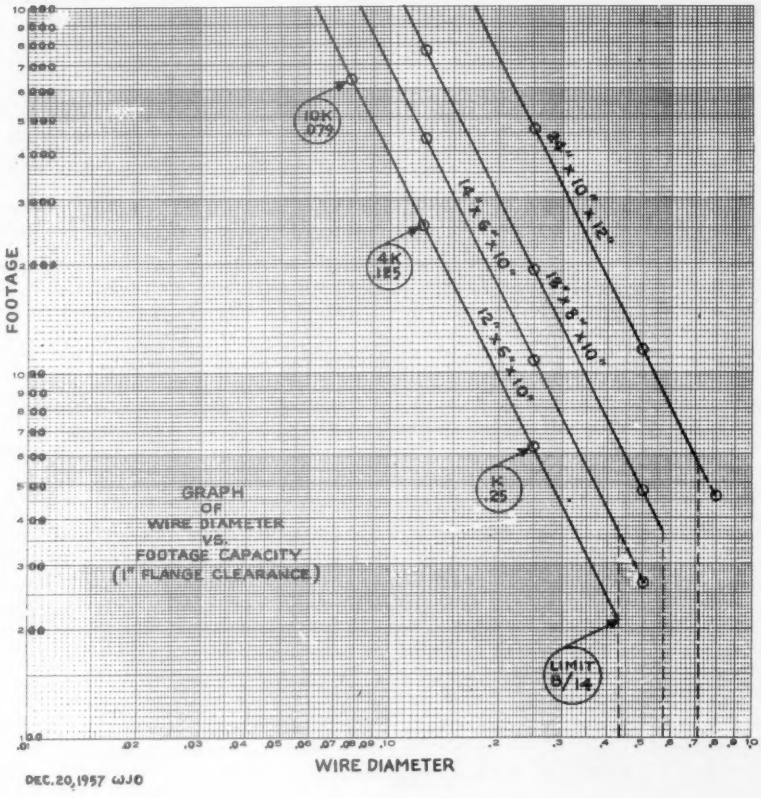
★ ★ ★

Set up Table II as below:

| A | A−2X = $A_1$ | $A_1^2$ | B | $B^2$ | $A_1^2 - B^2$ | D = .25" C | K | .079" 10K | .125" 4K | .500" K/4 | .790" K/10 | B/14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 10 | 100 | 6 | 36 | 64 | 10 | 640 | 6400 | 2560 | | | .43 |
| 14 | 12 | 144 | 6 | 36 | 108 | 10 | 1080 | | 4320 | 270 | | .43 |
| 18 | 16 | 256 | 8 | 64 | 192 | 10 | 1920 | | 7680 | 480 | | .57 |
| 24 | 22 | 484 | 10 | 100 | 384 | 12 | 4608 | | | 152 | 461 | .71 |

Using these figures, a graph (Figure II) is plotted and from the graph an incremental chart (Figure III) is produced.

FIGURE II




## Technique of the Nomographic Method

The nomographic method is a still simpler technique that can be utilized for the construction of reel charts. Reliable data can be determined readily from the standard nomograph form shown in Figure IV once it has been developed for the desired reel or family of reels.

★ ★ ★

It is established as follows:—

Calculate the value K for the specific reel using the equation (11)

$$K = [C\,(A_1^2 - B^2)]$$

★ ★ ★

This value of K is the footage pack for 0.25" diameter cable on the specific reel.

★ ★ ★

With a straight edge plot a straight line between 0.25" on the wire and cable diameter scale (D) to the value K on the footage pack scale (F). For very large reels, the values of F = K/10 vs .790" diameter or F = K/20 vs 1.20" di-

FIGURE III

INCREMENTAL CHART PLOTTED FROM GRAPH

| Reel Size | Head | Traverse | Drum | 12" 6" 10" | 14" 6" 10" | 18" 8" 10" | 24" 10" 12" |
|---|---|---|---|---|---|---|---|
| Diameter of Wire | | | | Footage (1" Flange Clearance) | | | |
| .070 | | | | 9200 | | | |
| .075 | | | | 7100 | | | |
| .080 | | | | 6200 | | | |
| .085 | | | | 5600 | 9600 | | |
| .090 | | | | 5000 | 8500 | | |
| .095 | | | | 4450 | 7500 | | |
| .100 | | | | 4000 | 6800 | | |
| .110 | | | | 3300 | 5600 | 9900 | |
| .120 | | | | 2775 | 4750 | 8300 | |
| .130 | | | | 2375 | 4000 | 7100 | |
| .140 | | | | 2050 | 3500 | 6200 | |
| .150 | | | | 1775 | 3025 | 5350 | |
| .160 | | | | 1550 | 2650 | 4675 | |
| .170 | | | | 1400 | 2350 | 4150 | 1000 |
| .180 | | | | 1225 | 2100 | 3675 | 8750 |
| .190 | | | | 1110 | 1875 | 3300 | 8000 |
| .200 | | | | 1000 | 1700 | 3000 | 7250 |
| .220 | | | | 825 | 1400 | 2475 | 5900 |
| .240 | | | | 700 | 1175 | 2075 | 4750 |
| .260 | | | | 590 | 1000 | 1775 | 4250 |
| .280 | | | | 510 | 860 | 1500 | 3700 |
| .300 | | | | 440 | 750 | 1325 | 3200 |
| .320 | | | | 390 | 660 | 1160 | 2800 |
| .340 | | | | 340 | 590 | 1025 | 2500 |
| .360 | | | | 310 | 520 | 920 | 2250 |
| .380 | | | | 280 | 470 | 820 | 2000 |
| .400 | | | | 250 | 420 | 750 | 1825 |
| .425 | | | | 220 | 375 | 660 | 1600 |
| .450 | | | | | | 590 | 1425 |
| .475 | | | | | | 520 | 1275 |
| .500 | | | | | | 480 | 1150 |
| .550 | | | | | | 400 | 960 |
| .600 | | | | | | | 810 |
| .650 | | | | | | | 690 |
| .700 | | | | | | | 600 |

★ ★ ★

ameter.

★ ★ ★

**Where** the straight line crosses the index line for reel size determines the pivot point for the specific reel calculation. Then the footage pack on this reel for any wire or cable diameter may be determined by sighting a straight line thru the wire or cable diameter on Scale (D) and reading the value of footage on the Footage Pack Scale (F).

## Example

**Using** the same family of reels as in the previous example, set up:

**TABLE III**

| A | $A - 2X = A_1$ | $A_1^2$ | B | $B^2$ | $A_1^2 - B^2$ | C | K | B/14 |
|---|---|---|---|---|---|---|---|---|
| 12 | 10 | 100 | 6 | 36 | 64 | 10 | 640 | .43 |
| 14 | 12 | 144 | 6 | 36 | 108 | 10 | 1080 | .43 |
| 18 | 16 | 256 | 8 | 64 | 192 | 10 | 1920 | .57 |
| 24 | 22 | 484 | 10 | 100 | 384 | 12 | 4608 | .71 |

**The** four reels are then plotted on the index line for reel size as in Figure V to make a nomogram for the reel family.

★ ★ ★

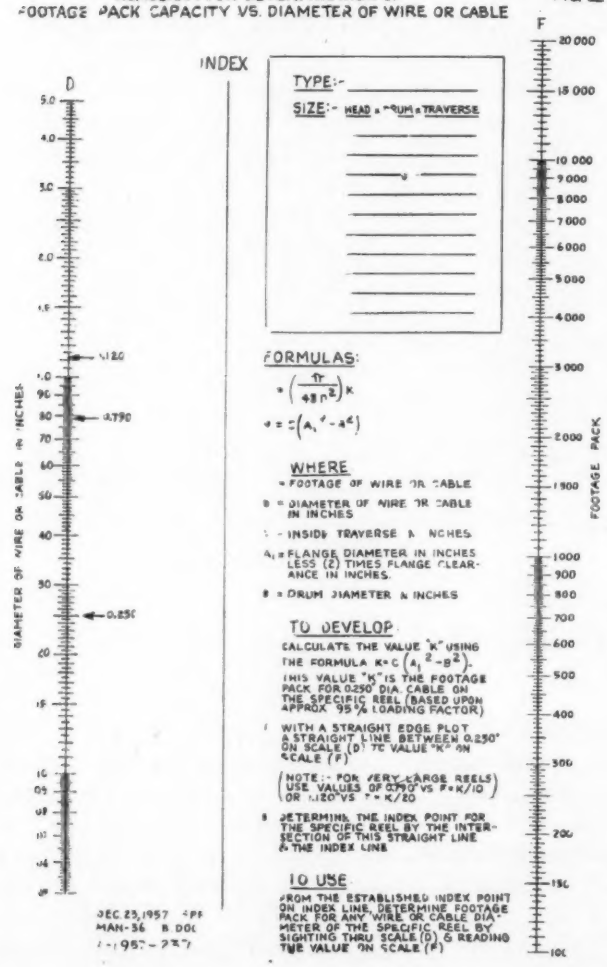
**It** may be noted that the same technique is applicable to spools and coils when the maximum overall diameter of the coil or coil box dimension limit as well as the traverse and drum dimension are known.

★ ★ ★

**Countless** hours of effort can be taken out of the preparation of such charts using these techniques with results essentially as reliable as the calculation from formula.

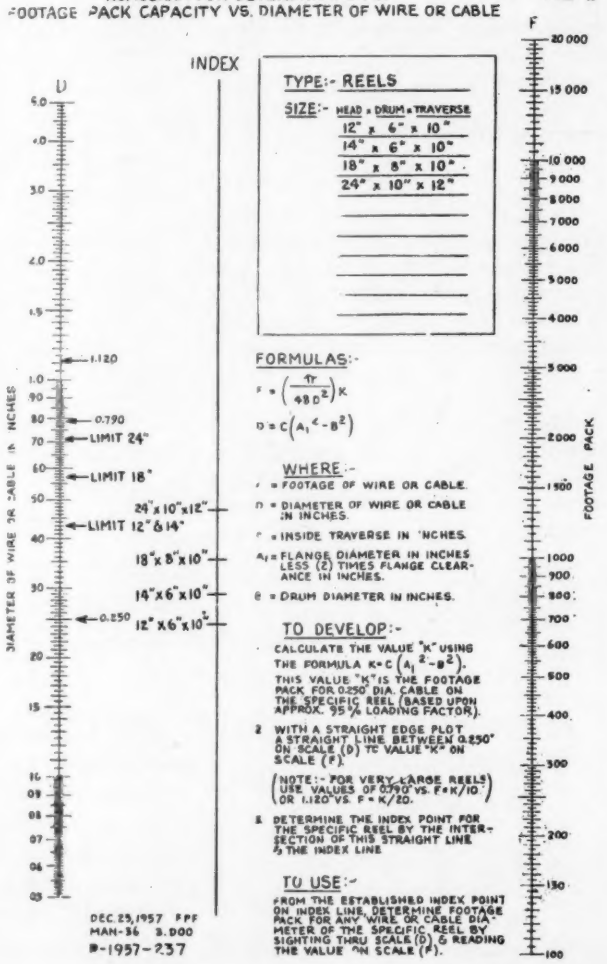
NOMOGRAM FOR DETERMINATION OF FOOTAGE PACK CAPACITY VS. DIAMETER OF WIRE OR CABLE

FIG. IV


INDEX
D
F
TYPE:-
SIZE:- HEAD x DRUM x TRAVERSE
FORMULAS:
WHERE
= FOOTAGE OF WIRE OR CABLE
B = DIAMETER OF WIRE OR CABLE IN INCHES
= INSIDE TRAVERSE IN INCHES
$A_1$ = FLANGE DIAMETER IN INCHES LESS (2) TIMES FLANGE CLEARANCE IN INCHES.
= DRUM DIAMETER IN INCHES
TO DEVELOP:
CALCULATE THE VALUE "K" USING THE FORMULA $K = C\left(A_1^2 - B^2\right)$.
THIS VALUE "K" IS THE FOOTAGE PACK FOR 0.250" DIA. CABLE ON THE SPECIFIC REEL (BASED UPON APPROX. 95% LOADING FACTOR).
WITH A STRAIGHT EDGE PLOT A STRAIGHT LINE BETWEEN 0.250" ON SCALE (D) TO VALUE "K" ON SCALE (F).
(NOTE:- FOR VERY LARGE REELS USE VALUES OF 0.790 VS F = K/10 OR 1.120 VS F = K/20.
DETERMINE THE INDEX POINT FOR THE SPECIFIC REEL BY THE INTERSECTION OF THIS STRAIGHT LINE & THE INDEX LINE
TO USE
FROM THE ESTABLISHED INDEX POINT ON INDEX LINE, DETERMINE FOOTAGE PACK FOR ANY WIRE OR CABLE DIAMETER OF THE SPECIFIC REEL BY SIGHTING THRU SCALE (D) & READING THE VALUE ON SCALE (F).
1.120
0.790
0.250
DIAMETER OF WIRE OR CABLE IN INCHES
FOOTAGE PACK
DEC. 23, 1957 4PP
MAN-36 B.DOC
B-1957-237

NOMOGRAM FOR DETERMINATION OF FOOTAGE PACK CAPACITY VS. DIAMETER OF WIRE OR CABLE

FIG. V


INDEX
D
F
TYPE:- REELS
SIZE:- HEAD x DRUM x TRAVERSE
12" x 6" x 10"
14" x 6" x 10"
18" x 8" x 10"
24" x 10" x 12"
FORMULAS:-
WHERE:-
= FOOTAGE OF WIRE OR CABLE
D = DIAMETER OF WIRE OR CABLE IN INCHES.
= INSIDE TRAVERSE IN INCHES.
$A_1$ = FLANGE DIAMETER IN INCHES LESS (2) TIMES FLANGE CLEARANCE IN INCHES.
= DRUM DIAMETER IN INCHES.
TO DEVELOP:-
CALCULATE THE VALUE "K" USING THE FORMULA $K = C\left(A_1^2 - B^2\right)$.
THIS VALUE "K" IS THE FOOTAGE PACK FOR 0.250" DIA. CABLE ON THE SPECIFIC REEL (BASED UPON APPROX. 95% LOADING FACTOR).
WITH A STRAIGHT EDGE PLOT A STRAIGHT LINE BETWEEN 0.250" ON SCALE (D) TO VALUE "K" ON SCALE (F).
(NOTE:- FOR VERY LARGE REELS USE VALUES OF 0.790 VS F = K/10 OR 1.120 VS F = K/20.
DETERMINE THE INDEX POINT FOR THE SPECIFIC REEL BY THE INTERSECTION OF THIS STRAIGHT LINE & THE INDEX LINE
TO USE:-
FROM THE ESTABLISHED INDEX POINT ON INDEX LINE, DETERMINE FOOTAGE PACK FOR ANY WIRE OR CABLE DIAMETER OF THE SPECIFIC REEL BY SIGHTING THRU SCALE (D) & READING THE VALUE ON SCALE (F).
1.120
0.790
LIMIT 24"
LIMIT 18"
24" x 10" x 12"
LIMIT 12" & 14"
18" x 8" x 10"
14" x 6" x 10"
12" x 6" x 10"
0.250
DIAMETER OF WIRE OR CABLE IN INCHES
FOOTAGE PACK
DEC. 23, 1957 PPF
MAN-36 B.DOC
B-1957-237

## IDA Elects Officers

**The Industrial Diamond Association of America, Inc.,** Pompton Plains, N. J., held its 13th Annual Meeting and Convention, May 27-28 at the Hotel Roosevelt, New York, and elected the following officers to serve for the coming year: as President, **Morris Winston,** Diamond Drill Carbon Co.; as First Vice President, Donald J. Wallace, Wheel Trueing Tool Co.; as Second Vice President, Bernard Jolis, U. S. Industrial Diamond Corp. Directors elected for the following two years were: Irving Freed, Freed Industrial Diamond Corp.; James A. Ross, Sprague & Henwood, Inc.; and Leonard A. Zucker, Union Wire Die Corp. The out-going President, Willard L. Huber, Diamond Tool Research Co., Inc., will serve as Director for the coming year. Directors elected last year and who will remain in term for the following year are: Milton Berk, Herman J. Meinert, Leopold H. Metzger and Charles Slesinger.

★ ★ ★

**The** Convention was arranged by **Mrs. Margaret J. McGinnis,** Executive Manager, Secretary-Treasurer, and Messrs. Huber, Wallace and Winston. Some of the topics discussed during the General Sessions were those on the standardization of diamond power and wheels; IDA's recent participation in the American Society of Tool Engineers Exhibition; Government stockpile of fine diamond dies; membership matters; new technical developments and public relations programs. No decision was reached as to the 1959 Convention site.

## AS&W Installs New Wire Furnaces

**In** a continuing effort to meet the most exacting requirements of customers for wire and rod, U. S. Steel's **American Steel and Wire Division** has installed at its Cuyahoga Works in Cleveland six of the largest radiant tube, high convection wire annealing furnaces ever built.

★ ★ ★

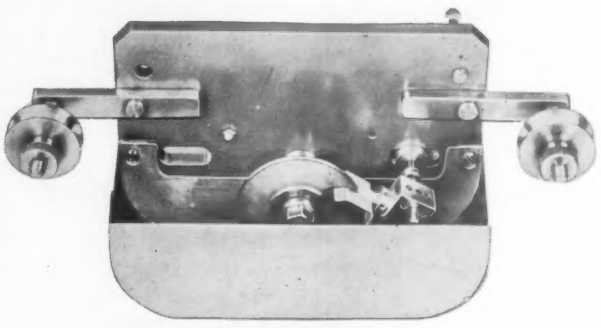
**The** new furnaces—circular in shape—are 114 inches in charge diameter, and produce up to 5 million BTUs per furnace per hour. Each has a capacity of 24,000 pounds of product. Coils of rod or wire can be stacked to a height of 9 feet on four vertical spindles, or "spiders." Annealed wire and rod are required by the cold heading industry—for nuts, bolts, rivets and screws, and other specialized uses.

★ ★ ★

**Operating** under precise atmospheric conditions, the furnaces anneal wire at temperatures up to 1,400 degrees over a 24 to 36-hour cycle in order to impart a uniform metallurgical structure to the metal. A glass-enclosed control room, features the most modern automatic temperature control equipment.

★ ★ ★

**For** continuity of operation, 12 furnace bases have been provided. As a furnace nears the end of its heating cycle, coils of rod and wire are stacked on the spindles by means of a new hydraulic loading

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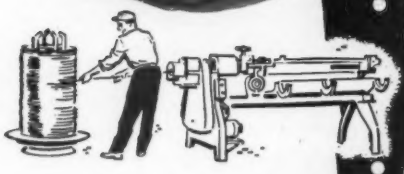

**ECONO-COIL**—Reduces scrap loss up to 90 percent. Saves material handling time. The Econo-Coil gives you continuous length wire coils of 2000# to 3000# catchweight, in sizes from 12 gage through ½" diameter. Shipped on returnable Econo-Coil reels.

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and stripping machine. Next, an overhead crane lifts the loaded spindles onto an empty base. Finally, the furnace is crane-lifted and placed on the base.

★ ★ ★

**The** furnaces, as well as the loading and stripping machine, were manufactured and installed by **Lee Wilson Engineering Co.,** of Cleveland, to replace six older ones.

## Cable Sealant Developed

**Union Carbide** K-1999 Silicone Cable Sealant is designed specifically for use in cable produced to meet MIL-C-19381A Special Purpose Electrical Cable (Nuclear Plant) Specification.

★ ★ ★

**K-1999** can be easily pumped with conventional sealant handling equipment while still passing the drip test specified in MIL-C-19381A. It has a remarkably stable consistency when subjected to extreme temperatures, retaining its effectiveness in the range of —60 to +500 degrees Fahrenheit. K-1999 remains in place without the need of physical confinement and, most important of all, requires no heat curing. The properties of K-1999 make it attractive for sealing and caulking applications where temperature stability and inorganic characteristics are required.

★ ★ ★

**For** additional information, write to Silicones Division, **Union Carbide Corporation,** 30 East 42nd St., New York 17, N. Y.

## Aluminum Conductor General Engineering Data

A major "first" in availabilitv of engineering data for users of aluminum electrical conductors has been achieved by **Aluminum Company of America.**

★ ★ ★

**With** publication of "Aluminum Electrical Conductors — General Engineering Data," conductor users for the first time may consult a compelte listing of approximately 4,000 immediately available sag and tension charts encompass-

ing virtually every type of covered and bare aluminum conductor. This list is the most comprehensive series of charts available in the industry.

★ ★ ★

As part of the index, Alcoa has included a handy desk-top glossary of aluminum conductors, listed alphabetically by code name. The listing is planned as a major tool for use by purchasing, stores, and engineering departments of conductor users.

★ ★ ★

The sag and tension chart index is a major time-saver for conductor users. With a list of thousands of available charts on hand, users will be able to resolve their problem by referring to one or more of the existing charts. Return-mail service will be available on such charts, ordered by Alcoa chart number. This compares with several weeks necessary to have charts prepared "to order."

★ ★ ★

The 88-page booklet is being made available directly to all Alcoa's electrical conductor customers. Copies may be secured by conductor users upon request to any Alcoa sales office.

## Automatic Box Strapping Machine

A fully automatic steel strapping machine, the FlJ, has been announced by **Acme Steel Company,** manufacturer of steel strapping, tools and equipment.

★ ★ ★

The FlJ applies strapping with uniform, predetermined tension to a wide range of sizes of packages without an operator, as it can be set up to apply the required number of straps in the proper places depending on the size of the unit to be strapped. It has unlimited take up, which allows a wide range between the maximum and minimum size of the packages strapped.

★ ★ ★

As a package moves into the machine on a short length of power conveyor, the size of the package is sensed and the proper strapping pattern selected and actuated. The FlJ is easily inte-

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Soft, dry fillers — *Twi-Port* and *Glascor** (Fiberglas-centered for high tensile strength without added bulk). Used for control, power, appliance, coaxial and communications cables, and all types of portable and flexible cords.

*Patent Applied For

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★ ★ ★

**Complete** information is available from Acme Steel Company, 135th St. & Perry Ave., Chicago 27, Ill.

### Three Miniature Coaxial Cables Approved To New MIL-C-17

**Three** Kel-F jacketed "Teflon" miniature coaxial cables designed for RF transmission in military electronic equipment are now available in full production quantities, it was announced by **Tensolite Insulated Wire Co., Inc.,** Tarrytown, N. Y.

★ ★ ★

**These** wires, with superior abrasion and chemical resistance, have full "Qualified Producer's List" approval to new military specification MIL-C-17 (supersedes MIL-C-8721). They utilize a 30 AWG (7/38 of silver plated copperweld) conductor. The primary insulation of extruded "Teflon" resin is shielded with a braid of 38 AWG silver plated copper, and jacketed with monochlorotrifluoroethylene (Kel-F) to a minimum wall thickness of 7 mils.

### Wire Rod and Bar Cleaning Machine

**The Wheelabrator Corporation** has announced a series of special cabinets designed for descaling wire rod and bar stock. These machines make it possible to automate blast cleaning and cold drawing, cold heading, or patenting into one continuous operation.

★ ★ ★

**This** in-line airless blast cleaning enables manufacturers to descale their own rod or bar stock at a lower cost than possible when buying pickled rod or bar for further manufacture into cold drawn products.

★ ★ ★

**There** are a variety of machine designs available capable of handling single strands at speeds up to 600 f.p.m. Up to 18 strands can be cleaned in a single cabinet following patenting furnaces. The par-

ticular design of these machines is usually dictated by the speeds necessary for subsequent production operations.

★ ★ ★

**In** addition to faster cleaning, the process developed by Wheelabrator eliminates multiple handling, acid, and acid disposal problems often associated with pickling.

★ ★ ★

**The** shot blasted surface provides a superior finish for coating and die lubrication. There are practically no limitations to the types of hot rolled rod and bar stock that can be effectively cleaned. This process can be applied to ferrous and non-ferrous hot rolled material in the production of cold drawn products.

★ ★ ★

**For** additional information, write to Wheelabrator Corp., 1184 S. Byrkit Street, Mishawaka, Indiana.

### Textron Acquires Waterbury Foundry & Machine

**Dale Mitchell,** President of **The Waterbury Farrel Foundry & Machine Co.,** Waterbury, Conn., announced that the stockholders of the company, at a special meeting, approved sale of the assets, property and business of the company to **Textron Inc.** of Providence, R. I.

★ ★ ★

**The** closing date was June 28, 1958, and thereafter the business will operate as the Waterbury Farrel Foundry & Machine Co., Division of Textron Inc. Mr. Mitchell, as Divisional President, will continue as executive head of the business.

### "Electrical Hall Of Fame" Is Planned For Niagara Falls

A committee of industrial leaders in Niagara Falls, N. Y., has started work on a plan to convert the old Edward Dean Adams power plant on the upper river into an "electrical hall of fame."

★ ★ ★

**The** committee, organized by **James G. Marshall,** 88-year-old retired Electro Metallurgical Com-


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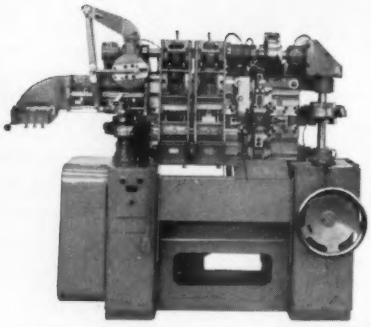

*A development of industry-wide importance is the Torrington Verti-Slide—a new vertical 4-slide that is the first major innovation in the basic field of wire and strip forming equipment in half a century!*

*The Verti-Slide was designed to meet a serious need for greater versatility, lower tooling cost, faster set-up time and reduced floor space. We urge you to investigate the new Torrington Verti-Slide in detail.*

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pany works manager, decided at a meeting at Hotel Niagara to make overtures to the federal and state governments, electrical equipment manufacturers and historical societies for help in making the old plant a permanent museum.

★ ★ ★

**The** Adams plant is to be taken out of service when the new power plant at Lewiston goes into operation in 1961.

★ ★ ★

**It** was from the Adams plant in 1895 that alternating current was first transmitted over a long distance. Power from the Adams plant was used to illuminate the new street lights in Buffalo — 25 miles away.

★ ★ ★

**Martin J. Travers** was named chairman of the executive committee that will push the project.

★ ★ ★

**Mr. Marshall** told the committee there are 32 acres of land available at the Adams station site that would be "admirably suited to use as a public park."

## Dunvegan Bridge Large User of Wire Rope

**About** $300,000 worth of wire rope is going into the 1,800-foot Dunvegan suspension bridge which the Alberta government is building across the Peace River in the Northern part of the province.

★ ★ ★

**This** is one of the largest orders for wire rope ever placed and was won by **British Ropes Canadian Factory Ltd.** of Vancouver. It includes 40 lengths of 2⅛ inch diameter bridge strand to be hung in two clusters of 20 cables each from the main bridge suspension cables. Also 76 lengths of 2¼ inch diameter bridge strand for 38 vertical suspendor cables.

★ ★ ★

**British Ropes** won the order in competition with firms from the U. S., Europe, Japan and Canada. Dominion Bridge is the main contractor for the project.

## Technical Data on Electron Microscope in New Folder

A new 6-page folder containing engineering information on the Norelco EM-100B Electron Microscope is available gratis from the Instruments Division, **Philips Electronics, Inc.,** 750 South Fulton Ave., Mount Vernon, N. Y.

★ ★ ★

**Text** covers construction details, electron optical system, electron source, condenser lens, objective lens and intermediate lens systems. Sections are included on the beam wobbler, electron optical alignment, electronic power supplies, vacuum system, and photographic equipment including 35mm, 2 x 2 in. plate and front-end cameras.

★ ★ ★

**Paragraphs** discuss the micron marker and X-ray protection. Cross-sectional drawings clearly show mechanical construction, electron paths, microscope tube and electron-optical system, and focusing principle.

## Titan Opens West Coast Plant

**Facilities** and products offered by a new brass plant at Newark, Calif., are pictured in a new 6-page folder just released by **Titan Metal Manufacturing Company.**

★ ★ ★

**Rods** and forgings produced in the Newark plant, as well as welding rods, forging rods, brass pressure die castings, "Tru Shaft" boat shafting, brass wire and special shapes supplied from the Newark depot are described in the folder. The Titan installation is the first brass mill in the San Francisco Bay area.

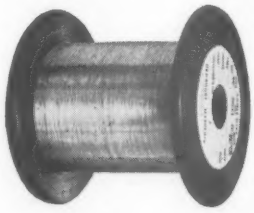
★ ★ ★

**The** Titan folder can be secured free by writing Titan Metal Manufacturing Company, Newark, Calif.

## Booklet Describes Cable For "Hot Spot" Applications

A new four page booklet describing Asbestos Varnished Cambric Insulated Power Cables for use in high temperature locations, is offered by **Triangle Conduit and**

**How Lestershire Bobbins save money for Wire Manufacturer and its customers**



Because they take rough handling in shipment, are re-usable and weigh far less than metal bobbins, Lestershire Wire Bobbins cut costs and losses for both a magnetic wire manufacturer and its customers.

**Withstand rough treatment.** Extra dense Vulcanized Fibre bobbin heads prevent damage to wire or bobbins in transit. Where brittle, metal-bound wood heads chip easily, shock-absorbing Vulcanized Fibre heads resist chipping and denting. In fact, Vulcanized Fibre has *self-healing* properties; bumps "iron themselves out" to the original, smooth, hard finish.

**Last indefinitely.** Lestershire patented anchor screw construction gives extra ruggedness to the head-barrel joint. Added strength in materials and construction means that Lestershire Wire Bobbins wear indefinitely. You can use them over and over again—and save the cost of frequent replacements.

**Save shipping charges.** Vulcanized Fibre weighs less than half as much as aluminum. The light weight of Lestershire Bobbins means big savings in shipping.

**Send for free details.** For full information on the Lestershire Line of Wire Bobbins, get our 12-page comprehensive Bobbin Manual. Write for your free copy direct to: Dept. GG–8.

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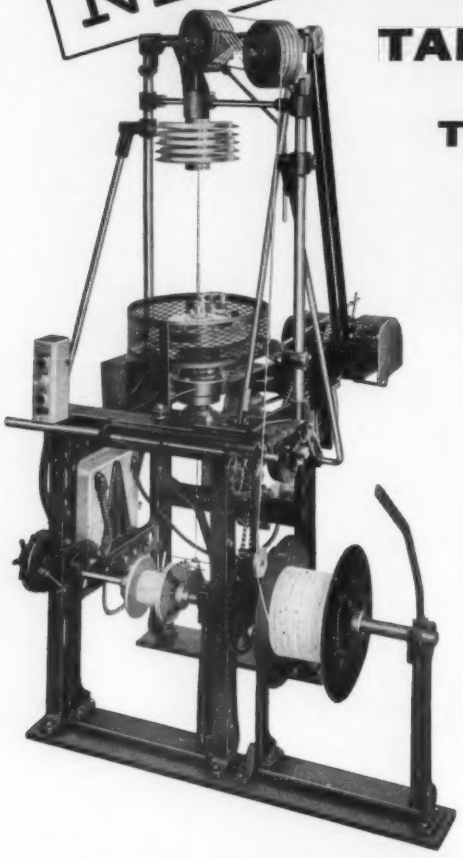
NATIONAL VULCANIZED FIBRE CO.
WILMINGTON 99, DELAWARE • *In Canada:* NATIONAL FIBRE COMPANY OF CANADA, LTD., Toronto 3, Ontario

NEW **WARDWELLIAN®**

**TAPE SERVER**

**TYPE N.T.T.**



*for Teflon, vinyl, and many other types of tape within specification range.*

- Serving head speed adjustable from 375 RPM to 1200 RPM, dependent upon character of material.
- Maximum diameter of flexible conductor ¼".
- Takeup adjustable for any desired lay with tapes up to ½" maximum width.
- Supply package 7" maximum diameter, 3" hole.
- Rate of production dependent upon width of material and angle of lay.
- Machine equipped with "Varidrive" motor.
- Machine operation fully electrically controlled.
- Serving head mounted on heavy duty ball bearings.
- Serving head can be operated clockwise or counter-clockwise.
- Machine equipped with new type multi-groove takeup sheaves and idler pulleys insuring a uniform product.
- Improved wire payoff tension control.
- Counter furnished for measuring product in feet.
- Light windup for winding small conductors on reels 30" diameter, 13" overall width.

*Complete information available on request.*

276-8

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Representatives for Europe, British Colonies and Dependencies
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**Cable Company, Inc.,** New Brunswick, N. J.

★ ★ ★

**The** booklet describes the application of this group of cables, and gives complete specifications and technical information of the three principal types—AVA, with an Asbestos Braid outer covering; AVB, with a Cotton Braid outer covering; and AVL, which is covered with lead.

## Riverside-Alloy Issues Price Book

A 42-page price schedule featuring Monel, Inconel, Inconel X, nickel clad copper and other special nickel alloys has been issued by **Riverside-Alloy Metal Division, H. K. Porter Company, Inc.**

★ ★ ★

**Most** computations for quantity extras are eliminated by the schedules' simple format. Standard practices for each alloy are set-up on left-hand pages, and prices are placed on corresponding right-hand pages. The use of bold type alternated with clear italics makes the price columns easy to use. Horizontal lines separate price lists.

★ ★ ★

**Useful** tables, including comparison of gauges, electrical properties and specifications, have been added. The new schedule, printed in the standard 8½ x 11 inch size, has convenient 3-hole punching for insertion into any normal binder. Copies of the book may be obtained by writing: Publications Section, Riverside-Alloy Metal Division, Riverside, N. J.

## New Series of Tractors Announced by Barrett-Cravens

A completely redesigned and improved series of electric tractors has been introduced by **Barrett-Cravens Co.,** Northbrook, Ill.

★ ★ ★

A radical improvement is the new gear drive which is a complete departure from the old chain drive method. The gears are totally enclosed, revolving in a constant bath of oil. The gear drive is constructed as a single piece unit, with motor, transmission and drive

wheel mounted in a balanced vertical column. Power is furnished by a specially designed high torque motor, and a 24-volt battery. All control and power leads are stationary, with no flexible current conductor to weaken and wear.

★ ★ ★

**Smooth** tractor acceleration is assured by the new adjustable time delay mechanism through four speeds forward and reverse—prevents jerking trailers from a standing start.

★ ★ ★

**The** operator has comfortable standing position on a platform 7" from floor level. Dual controls for braking and acceleration conveniently located on the steering handle can be operated with either right or left hand. Fast-acting 7" dia. automotive brakes of the internal expanding type assure quick stops.

★ ★ ★

**The** standard SX-24 Standup Riding Model has speeds of 6¼ mph without load, 3¼ mph with maximum rolling load. Ultimate drawbar pull is 550 lbs.

★ ★ ★

**The** new tractors are immediately available in a standup riding model, a sit-down riding model, the Radox radio remote controlled type, and the Guide-O-Matic equipped electronically guided tractor which needs no operator to steer it along a pre-determined route. For more information write Barrett-Cravens Co., 628 Dundee Rd., Northbrook, Ill.

## Folder on Flat Aluminum Wire

**A** six-page technical reference folder giving specifications, engineering data and availabilities of aluminum flattened wire has just been published by **Kaiser Aluminum & Chemical Sales, Inc.**

★ ★ ★

**Manufacturers** in many industries are using aluminum flattened wire for such applications as transformer windings, current limiting reactors, welding transformers, electrical cable armor, ornamental grillwork, utensil components, garment stiffeners, zippers and close tolerance mechanical parts for typewriters and computers.


*for*

**WIRE and CABLE INSULATION**

**BLACAR®**

**CARY CHEMICALS, SPECIALIZING IN THE WIRE COVERING FIELD, OFFER TWO OUTSTANDING PVC COMPOUNDS — PROVIDING MAXIMUM PROCESSABILITY, FAST EXTRUSION AND UNIFORMLY HIGH QUALITY.**

If your needs are special—Cary can modify existing formulations or custom-formulate to the most exacting requirements.

**BLACAR® 2700:** UL-approved primary insulating material designed for low cost building wire applications—specifically: T, TW, TF, TFF, type wire (including oil exposure at 60°C).

Provides excellent processing features, high extrusion rates, good electrical properties, plus a smooth glossy finish. Ideal for use as a general-purpose material for a wide range of low-tension wires and cables.

**BLACAR® 2600:** UL-approved vinyl insulation material for type T, TF, and TFF wire and cable applications. BLACAR® Compounds are available in natural, white or black—in powder, diced or pellet form.

***Write for data, working samples or technical assistance.***

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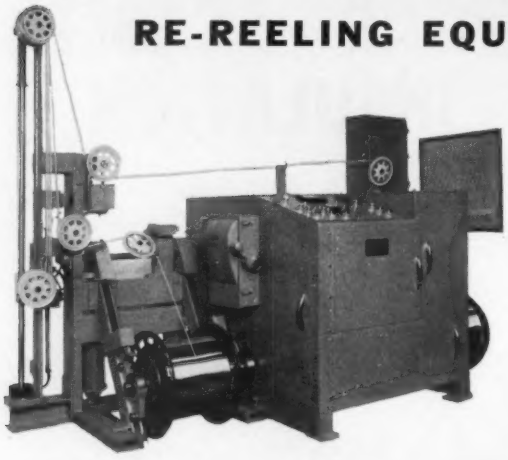
THE LAST WORD IN MODERN RE-REELING EQUIPMENT!



NEW JLE

5,000 F.P.M.
1½-POUND
WIRE TENSION

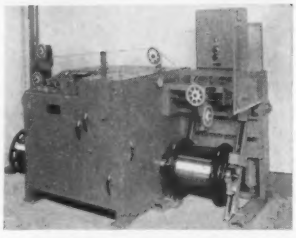
# HIGH-SPEED RE-REELER *Class V*

The output of any production line depends upon the speed, efficiency, reliability and ease of operation of its component machinery.

The Class V High-Speed Re-Reeler is still another unit in the new James L. Entwistle Company line, completely re-engineered and re-designed to meet today's more exacting wire industry requirements.

**FEATURES:**

- *Constant wire speed is adjustable up to 5,000 f.p.m.*
- *Constant wire tension is adjustable from 1½ to 5 pounds.*
- *Compact, console-type control panel.*
- *All control relays are of plug-in type, and are quickly and easily accessible.*
- *Reels are raised and lowered pneumatically, and have an 18-inch O.D., 450-pound loaded capacity.*
- *Both payoff and take-up reels are motorized, and reel shaft clutches are air-operated.*
- *Friction-free dancer and new worm traverse are equipped throughout with ball bearings and ball bushings.*
- *All sheaves are of nylon with ball bearings.*



REVOLUTIONARY NEW SPARK TESTER ELECTRODE UNIT NOW READY!

Spark Testing is now more precise than ever before with the new JLE completely enclosed "FOG-BANK"* Electrode Unit. Ask for details today!

**James L. Entwistle Co.**

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ENGLAND: *General Engineering Co. (Radcliffe) Ltd.*
*Station Works - Bury Road*
*Radcliffe, Lancashire, England*

* PATENT APPLIED FOR


**The** folder also discusses the advantages, economies and performance characteristics of the wire and provides charts on mechanical and physical properties. Copies may be obtained free from any Kaiser Aluminum sales office or from Kaiser Aluminum & Chemical Sales, Inc., Department NR-15, 919 North Michigan Ave., Chicago 11, Ill.

## Improved Device for Serving Insulating Tapes Developed

**An** improved device for wrapping insulating tapes on wire and cable has been developed by the assistant plant engineer of **Rome Cable Corporation,** Rome, N. Y. Paper, cotton, fiberglass or any combination of the three tapes can be applied with the new model, say company engineers.

★ ★ ★

**According** to the inventor, **Dean L. Williams,** the device cuts down machine vibration, a cause of insulation breakage during production runs. Because it can operate at faster speeds (4,000 revolutions per minute compared to 3,000 with the model used previously) it increases output.

★ ★ ★

**The** invention features a two-piece hollow shaft. The rear portion is stationary and is integral with the mounting flange. This results in an extremely rigid mounting which helps reduce vibration—a problem with the old design.

★ ★ ★

**The** tension of the tape being wound can be adjusted while the machine is in operation. This was not possible with the older apparatus. A more uniform wrapping can now be accomplished resulting in a superior magnet wire product.

If you're bragging about progress, just remember we've still got 18,215 blacksmith shops in the country, and less than half that many bookstores.

# Outstanding Personalities of the Wire Industry

## Carpenter Steel Appointments

**The Carpenter Steel Co.,** Reading, Pa., has appointed **James O. Peale** as manager of distributor sales, with headquarters at the company's home office in Reading. In his new position he will act as product manager to the non-exclusive stainless distributor customers.

★ ★ ★

**His** previous experience includes twenty years of service in the steel sales division of Henry Disston & Sons as manager of the New York district and special accounts. In July, 1956, he joined former Northeastern Steel Corp., Bridgeport, Conn., as New York district sales manager and manager of sales agents.

★ ★ ★

**The** company also has appointed **W. Kent Kise, Jr.,** as metallurgist in the special alloys development group. In his new position, he will assist in the development of Carpenter alloys for electronic, magnetic and electrical applications. Educated at the University of Maryland, he received his B.S. in mechanical engineering and did advanced work in metallurgy there as well.

## Ray Snow Has New Address

**S. Ray Snow,** who retired from his active duties with U. S. Steel's **American Steel and Wire Division** last Spring to bask in the sunshine and sea breezes of Florida, writes that he has purchased a home and that hereafter his address will be 1223 Harding St., Winter Park, Florida.

★ ★ ★

**Ray's** many friends will be interested to have the new address and to learn that he hopes to see us all in Atlantic City at the Convention in October.

## Appointed Assistant Superintendent

**Appointment** of **Howard W. Bennett** as assistant superintendent of steel production for the Houston mill of the Sheffield Division of Armco Steel Corp., has been announced by **K. P. Campbell,** works manager of the mill.

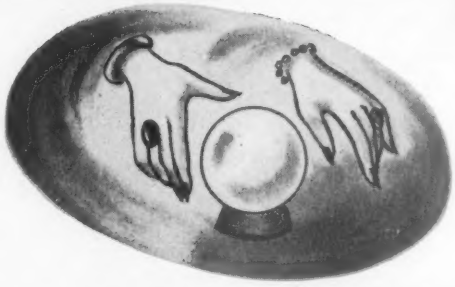
★ ★ ★

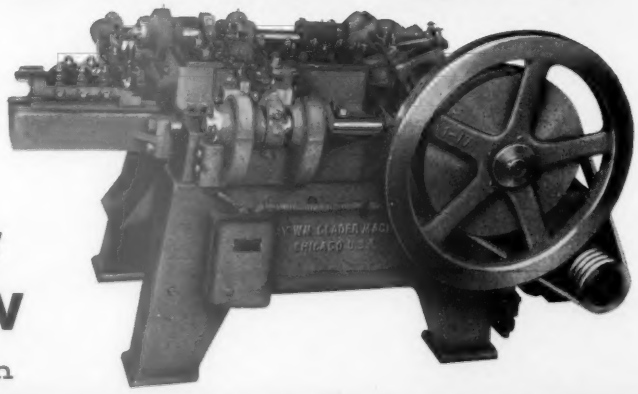
**Mr. Bennett,** who has served in various capacities at the mill since 1942, will be in charge of the electric furnace shop.

## Crucible Steel Promotes Two Men

**William R. Howell,** works manager at **Crucible Steel Company** of **America's** Midland (Pa.) works since 1947, has been appointed assistant to the vice president-operations, with offices at Company headquarters in Pittsburgh. Suc-


IF THERE'S A NAIL MACHINE IN YOUR Future make it a GLADER





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ceeding Mr. Howell as works manager at Midland is **George M. Burrier.**

★ ★ ★

**Mr. Howell** has been with Crucible at Midland for 37 years. He joined the Company as laborer in 1921, worked in various departments, was made assistant works manager in 1945, and works manager two years later. He studied mechanical engineering at Carnegie Institute of Technology.

★ ★ ★

**Mr. Burrier,** 51, has been with Crucible since 1950 when he joined the Company as assistant general superintendent at the Midland works. He was named assistant works manager in 1953. He is a graduate of the University of Pennsylvania where he received a Mechanical Engineering degree in 1932.

### Made Executive V.P. by Borden

**Eugene J. Sullivan** became executive vice president of the **Borden Chemical Company** on July 1, it was announced by **Augustine R. Marusi,** president of this division of the Borden Company.

★ ★ ★

**Mr. Sullivan,** vice president in charge of sales of the Borden Chemical Company since Jan. 1, 1957, succeeds **H. H. Clarke, Jr.** who recently left the Borden Chemical Company to become president of Dyna-Therm Chemical Corporation of Culver City, Calif.

### Made Superintendent of Merchant Mills

**William C. Campbell** has been appointed superintendent of merchant mills, Youngstown District, according to an announcement by **E. O. Reese,** district manager. He succeeds **Clark S. Lambert,** who has retired after nearly 21 years of service with the company.

★ ★ ★

**Mr. Campbell** joined the Youngstown Sheet & Tube Company in 1934 and worked in various positions in the mill.

**He** has served as a time study engineer, industrial engineer, general industrial engineer and division industrial engineer. He became assistant superintendent of Merchant Mills, the position he held at the time of his most recent promotion, in March, 1954.

### L.O.F. Appoints Engineer To New Post

**Richard A. Pim** has been named chief engineer of the eastern division of **L. O. F. Glass Fibers Company,** it is announced by **John M. Keenan,** general factories manager. He was formerly process development manager of the firm.

★ ★ ★

**In** his new assignment, Mr. Pim has complete supervision of engineering operations in all eastern division plants. Three are located at Defiance, Ohio, with other plants in Waterville, Ohio, and Parkerburg, West Va. He will have headquarter at the company's technical center at Waterville.

Here is the difference between just any reel and MPS reels with
DURA CURL RIMS
Yes, it's the exclusive MPS heavy duty thickened-section rims that assure maximum strength and rigidity throughout the reel heads. Flange run-out and straightening expenses are eliminated by this patented MPS development. DURA-CURL rims are now standard on all MPS wire drawing, annealing, and stranding spools and reels. We invite your inquiries — let us tell you more about Dura-Curl rims.
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### Appoints Michigan Representative

**Metal Carbides Corporation,** Youngstown, Ohio, producers of Talide Carbides, has recently appointed **Karl P. Hockenbery** as District Sales Manager for the Michigan area. Headquarters will be in the firm's district office and warehouse at 20485 Van Dyke St., Detroit.

★ ★ ★

**Mr. Hockenbery** comes to Metal Carbides with an extensive experience in the use and application of carbides. He was a tool engineer at both Ford and Chrysler Corporation. He was also a sales engineer for Super Tool and Vascoloy-Ramet.

### RB&W Appoints Plant Superintendents

**Appointment** of plant superintendents at **Russell, Burdsall & Ward Bolt and Nut Company's** Port Chester, N. Y., and Los Angeles plants has been announced by **William E. Ward,** president.

★ ★ ★

**William Herman Schmidt** was named plant superintendent at Port Chester, after serving four years in that capacity in R B & W's Los Angeles plant. Replacing him as plant superintendent at Los Angeles is **Olof V. Johnson,** formerly machine shop supervisor.

★ ★ ★

**Mr. Schmidt** joined R B & W as machine shop supervisor in 1943 at its Los Angeles plant after serving as machinist and toolmaker for seventeen years in the Los Angeles area. He attended the University of California.

★ ★ ★

**Mr. Johnson** attended Northwestern University and spent 29 years with Teletype Corp. and The H. M. Harper Co. before joining R B & W in Los Angeles in 1955.

### Roebling Appointments

**Earl A. Frazier** has been appointed Seattle district sales manager for the Wire Rope and Aircord Division of **John A. Roebling's Sons Corporation,** replacing the late **Arthur R. Robinson.** The announcement was made by **Walter A. Huber,** General Product Manager. Mr. Frazier has been associated with the Roebling Corporation since 1938.

★ ★ ★

**Mr. Huber** also announced the appointment of **John P. Kadlic** as New York district sales manager for the same division, replacing Earl A. Frazier, who now heads the division's Seattle territory. He has been associated with Roebling since 1947. For the past seven years he has been in charge of the firm's wire rope sales in the Philadelphia district.

### AIMCO Announces Organizational Set-Up

**The American Insulating Machinery Company,** Philadelphia, Pa., regrets to announce that **Mr. Robert Burns,** Vice President and Secretary of the company for


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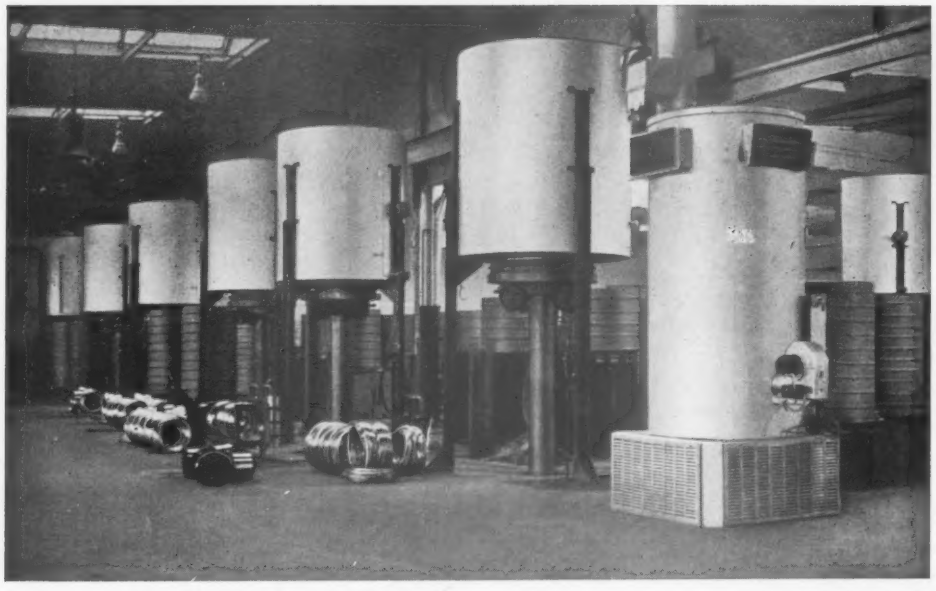

SEVERAL VACUUM BRIGHT ANNEALING UNITS WHICH WE HAVE INSTALLED IN ONE OF THE MOST IMPORTANT CABLE WORKS IN GERMANY

*(German and Foreign Patents)*

Cover-heated Galvanizing Furnaces with everlasting ceramic tank (Patent)

Continuous pull-through wire furnaces system "Becker" (Patent)

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Willowdale; Ont., Canada

OFENBAU **FRITZ** G.m.b.H. **HAGEN** i.W., W.-GERMANY

many years, passed away earlier this year.

* * *

**His** death has occasioned the necessity for certain changes, resulting in the election of some new officers. **Henry L. Benner,** President and Treasurer, continues in this capacity; **F. A. Benner** has been elected Vice President and Secretary; and **F. F. Vanderslice** has become Assistant Treasurer and Assistant Secretary.

* * *

**At** the same time the company announced the appointment of **H. P. Edinga** as Assistant to the President. Mr. Edinga has been identified with the Wire Industry in Europe and the United States for many years and has been connected with the North American Philips Company and the U. S. Army Signal Corps.

* * *

**While** with the latter he was employed in the Wire and Wire Machinery Division and since 1956, was assigned by the Signal Corps to the Martin Company, of Baltimore, Md., and to Orlando, Fla., on a project in the missile field.

* * *

**Messrs. T. Frey** and **G. L. LeBaron,** both of whom have been associated with AIMCO for a long time, continue to function as Chief Engineer and Shop Superintendent, respectively.

## Appointed Electrical Products Industry Finance Chairman for the United States Committee for the United Nations

**Robert C. Bennett, Jr.,** General Vice President of **National Electric Products Corporation,** 140 Stanwix Street, Pittsburgh, Pa., has been appointed Finance Chairman of the Electrical Products Industry for the United States Committee for the United Nations, it was announced yesterday by **Stanley M. Rumbough, Jr.,** National Chairman.

* * *

**The** United States Committee for the United Nations, now in its tenth year of activity, is a privately supported citizens organization whose Chairman is appointed annually by the President of the United States. Working through 120 voluntary national organizations, the purpose of the Committee is to "disseminate facts about the United Nations and to promote the observance of United Nations Day in the United States."

* * *

**Mr. Bennett** is president and director of the Building Wire and Cable Association and a member of the Electrical Manufacturers Club, the Newcomen Society, American Ordnance Association, and American Management Association.

## Canada Leading Nickel Producer

**For** more than 50 years Canada has led all other countries of the world in the production of nickel. Its output of the metal in 1954 was at a record high, amounting to more than four times that of the rest of the free world combined.

**Extra hard grain...**
**Extra easy way**
**to cut die refinishing costs**

Next to diamonds and diamond dust NORBIDE* grain is the hardest manufactured abrasive commercially available. Costing 300 to 500 times less than sized commercial diamonds, it brings steady savings to your refinishing operations on wire drawing dies — including ripping, semi-finishing and even some finishing. NORBIDE abrasive is already being used widely to cut unnecessary costs. It will pay you to investigate. For details and prices write to NORTON COMPANY, 45 New Bond Street, Worcester 6, Massachusetts. G-346

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## Armco Advances Two Mill Men

**Two** new supervisory appointments at **Armco Steel Corporation's** Baltimore Works have been announced by **C. C. McElvain,** works manager.

★ ★ ★

**Fred A. Emm** will become assistant to the manager and **A. Olin Grimes** has been appointed general superintendent of the stainless steel plant.

★ ★ ★

**Mr. Emm** had been general superintendent of the plant since 1945, and will coordinate the development of the steel works' $5\frac{1}{2}$ million bar rolling mill for tonnage rolling and improved mill product quality.

★ ★ ★

**He** began his career in the metals industry with the Crucible Steel Company. Before joining Armco 23 years ago, he was associated with the International Nickel Company.

**Mr. Grimes** was formerly assistant general superintendent at the Armco plant here. He joined the company in 1929 after graduating from St. Johns College and became foreman of the Baltimore Works' inspection and shipping department in 1942. In 1953 and 1954 he served as head of the plant's employee relations department and was appointed to his former position in 1954.

## To Manage EF's Western Office

**The Electric Furnice Co.,** Salem, Ohio, announces the appointment of **John W. Holzwarth** as Manager of its new Western District Office at 312 E. 17th St., Santa Ana, Calif.

★ ★ ★

**Mr. Holzwarth** originally joined the organization in 1940 and has served in the shop, erection, engineering and sales departments in both their electric and fuel divisions, and has had extensive experience in all phases of heat processing applications in connection with both ferrous and non-ferrous industries. The Western District Office includes California, Washington, Oregon, Utah, Nevada, and Arizona.

## AIM Elects Officers

**The American Insulating Machinery Company,** Philadelphia, Pa., regrets to announce that **Robert Burns,** Vice President and Secretary of the Company, passed away earlier this year.

★ ★ ★

**Due** to this loss certain changes in the management of the Company were necessary. **Henry L. Benner** was re-elected President.

★ ★ ★

**The** officers of the Company are now:

**President & Treasurer: Henry L. Benner**
**Vice President & Secretary: F. A. Benner**
**Ass't Treasurer & Ass't Secretary: F. Fisher Vanderslice**

★ ★ ★

**At** the same time the Company appointed **H. P. Edinga** Assistant to the President.


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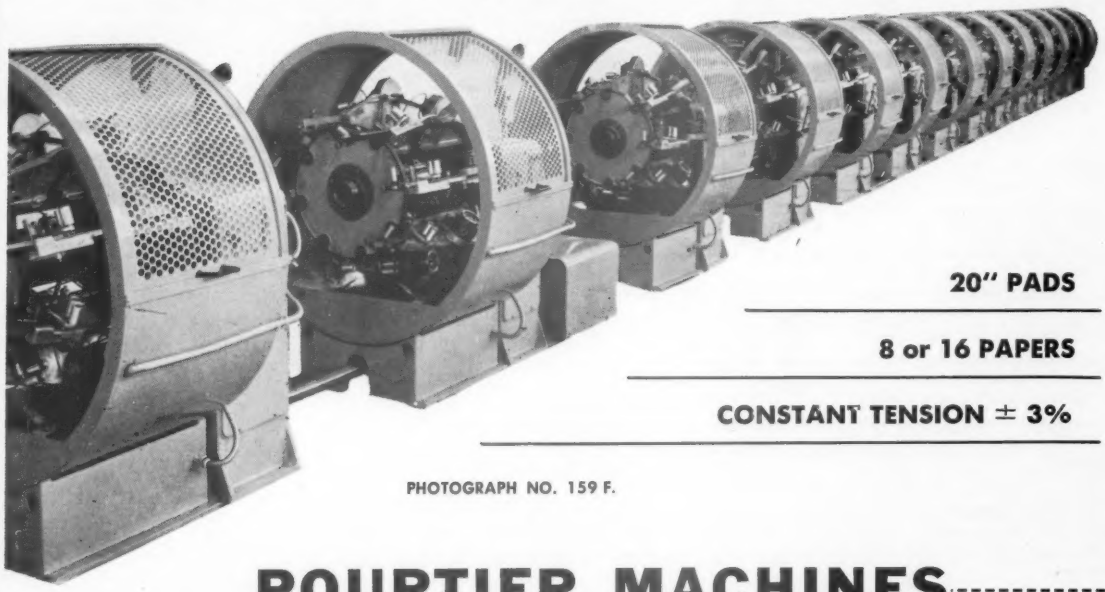

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**8 or 16 PAPERS**

**CONSTANT TENSION ± 3%**

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**ROMAINVILLE (Seine)** **FRANCE**

**Mr. Edinga** has been connected with the Wire Industry in the United States and Europe for many years in positions with **North American Philips** and **U.S. Army Signal Corps.**

★ ★ ★

**While** with the Signal Corps he was employed in the Wire and Wire Machinery Divisions and since 1956 he was assigned by the Signal Corps to the Martin Company of Baltimore, Md. and Orlando, Fla., on a project in the missile field.

★ ★ ★

**T. Frey** and **G. L. LeBaron,** both of whom have been with AIMCo for a long time, continue in their functions of Chief Engineer and Shop Superintendent respectively.

## Appoints Industrial Sales Manager

**William A. Baltzell,** formerly assistant sales manager, has been appointed industrial sales manager for **Oakite Products, Inc.,** now in its 50th year as manufacturers of industrial cleaning and metal treating materials. In his new position he will be responsible for the work of the company's seventeen divisions and two hundred and forty technical service representatives throughout the U. S. and Canada.

★ ★ ★

**Mr. Baltzell** joined Oakite's field service staff in 1941. He was appointed southern division manager in 1946, and became assistant sales manager in 1953. He is a member of the board of directors of the company.

## Engis Announces New Management for Hyprez Division

**Engis Equipment Company,** Chicago, has announced the promotion of **Robert E. Reid** from assistant manager to general manager of its Hyprez Division. Mr. Reid, with his assistants, will be in charge of all service to distributors and customers of Hyprez Diamond Compounds, Hyprez Oscillating Tool Finishing Machine, Di-Profiler Reciprocating Hand Machine and Accessories.

★ ★ ★

**At** the same time, Engis announces the appointment of **Walter B. Panco** as national sales manager of the Hyprez Division. Mr. Panko, who has been serving as assistant sales manager of the Hyprez Division, succeeds Joseph M. Throckmorton, who, after 16 successful years with the Company, is retiring from active duty. Mr. Throckmorton will, however, continue to be available to the Company as a consultant.

## Tyson Elected Officer of CF & I

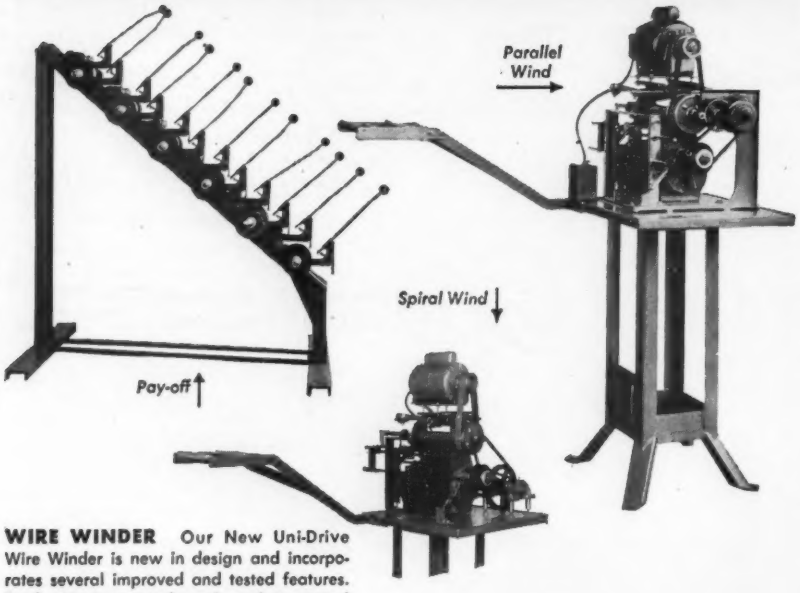
**Charles R. Tyson** has been elected executive vice president of **The Colorado Fuel and Iron Corporation,** it was announced recently by **A. F. Franz,** president.

★ ★ ★

**Mr. Tyson** is also executive vice president of **John A. Roebling's Sons Corporation,** a wholly-owned subsidiary with headquarters in Trenton, N. J., a post he has held since the Roebling firm was acquired by CF&I in December 1952, and has been a member of the board of CF&I since October 1953.

★ ★ ★


**STANDARD UNI-DRIVE WIRE WINDER**




**WIRE WINDER** Our New Uni-Drive Wire Winder is new in design and incorporates several improved and tested features. Production is stepped up through increased speed. It produces smooth, even and accurately wound spools of wire in single or multiple ends. All strands parallel — no over or under-winding. Can also be furnished with a slight spiral pattern for winding exceedingly fine wire. Automatic Stop Motion controls each strand. Traverse adjustable from 1¾" to 5½" between spool heads without changing cam. Designed especially for winding wire to be braided and shielded for electrical conductors.

*Various types of supply packages that may be wound on Standard Uni-Drive Wire Winder.*

**PAY-OFF** Our Pay-off Attachment consists of a heavy fabricated frame on which Pay-off spools are mounted to cover desired number of ends to be wound. Equipped with spindles, running on self-aligning ball bearings, with size of spindles and adapters to accommodate customers' pay-off spool. Compensating Attachment to control the tension of each individual strand of wire, applying the same tension when spool is full as when empty. Can also be adapted for use with bunching machines.

**STANDARD MILL SUPPLY COMPANY**
31 ESTEN AVENUE PAWTUCKET, R. I., U. S. A.

**He** had been president of the Roebling company prior to its acquisition by CF&I. He joined the company in 1935 as a student trainee and worked in various departments including the open hearth and wire mills. In 1936, he was elected treasurer and named to the board of directors of the company. He became secretary-treasurer in 1940.

### To Head Sales for Circle Wire & Cable

**Circle Wire & Cable Corp.**, producer of wire, cable and electrical metallic tubing, has appointed **S. Manuel (Mannie) Pearl** to the post of sales manager, it was announced today by **Milton S. Cohn**, Circle president.

★ ★ ★

**Mr. Pearl** has been associated with the electrical industry for more than 35 years. He is the founder and a former president of Litecor Inc. and affiliated companies, Brooklyn, N. Y. His association with Circle dates from December 1956.

★ ★ ★

**Circle**, with manufacturing facilities at Maspeth and Hicksville, L I., is a wholly owned subsidiary of Cerro de Pasco Corporation.

### Duvall Made Executive Vice President of Pittsburgh Steel

**Election** of **Donald C. Duvall** as executive vice president of **Pittsburgh Steel Company** was among four executive changes announced by **Allison R. Maxwell, Jr.**, president.

★ ★ ★

**Mr. Duvall**, a member of the board of directors, has been serving as assistant to the president and vice president-industrial relations.

★ ★ ★

**Mr. Duvall** has risen in Pittsburgh Steel's management after starting with the company in 1941 as an industrial engineer.

★ ★ ★

**He** attended Pennsylvania State College, California State Teachers College and did graduate work at the University of Pittsburgh.

★ ★ ★

**Other** changes were the election of **R. McL. Hillman** to the office of Vice President, Secretary and Treasurer; **R. E. Lauterbach** to V.P., Administration and Planning; and **J. S. Howard** to Assistant Treasurer.

### Clifford Resigns as Continental Steel Chairman

**Ralph K. Clifford**, who has been Chairman of the Board of the **Continental Steel Corporation**, Kokomo, Ind., has resigned that post, but continues as a member of the Board of Directors of the company.

### To Represent Cleveland Crane in South

**Eugene G. Bates** has been appointed Southern District Sales Manager for the Steelweld line of press brakes, heavy metal-cutting shears and straight-side presses of **The Cleveland Crane & Engineering Co.**, Wickliffe, Ohio.


# New! Improved! Fast!
# WELLS STRAIGHTENER & CUTTER

S & C machines for small diam. wires Speed: Approx. 115 F.P.M.

**This completely redesigned line combines maximum efficiency with that rugged dependability, for which WELLS S&C machines have become justly famous.**

**Built in several sizes to handle 2 to 18 ga. basic and high carbon wire.**

***FEATURES***

**The guide bar of these new machines can be supplied for any cut lengths • The rotary flier runs on ball bearings for smoothness and long life • Cut-off is actuated by a solenoid for extreme accuracy of cut lengths • A two point cam construction provides a quick and positive return of the cut-off knife, eliminating the need for a clutch and dog • A counter is standard equipment.**

A COMPLETE RANGE OF S & C MACHINES IS MADE BY WELLS FOR ALL SIZES OF WIRE. SEND FOR CATALOG ON THE COMPLETE LINE.

*Frank L. Wells Company*

*Builders of Fine Wire Working Machinery*

5821 FIFTH AVENUE • KENOSHA, WISCONSIN

# A Review of Recent Wire Patents

**The data listed below is only a brief review of recent patents pertinent to the readers and subscribers of this publication.**

**Complete copies of these patents may be obtained by writing to the publisher of this magazine and remitting 50c for each copy desired. For orders received from outside the United States the cost will be $1.00 per copy.**

No. 2,837,005, EXPANDING HELICAL COIL FOR A WOOD SCREW, patented June 3, 1958 by Max Gaul, Eppstein, Taunus, Germany, assignor to Hans Sickinger, Providence, R. I.

Disposed in the threads of the screw is a helical steel strip having a number of teeth along its edge, bent slightly outwardly. Rotation of the screw causes the teeth to be fixed into the walls of a cylindrical bore at spaced points, whereby the strip becomes fixed to the work and thereafter acts as a nut.

★ ★ ★

No. 2,837,295, UNCOILER WITH SIDE SHIFT CONTROL, patented June 3, 1958 by Russell T. Todd, Youngstown, and Paul McCreary, Poland, Ohio, assignors to The McKay Machine Company, Youngstown, Ohio, a corporation of Ohio.

This hydraulically-operated uncoiler for metal strip is for association with a pair of oppositely-disposed coil-supporting heads slidably mounted on a base for inward and outward movements toward and away from each other.

★ ★ ★

No. 2,837,744, METHODS FOR MAKING WIREBOUND BOX AND CRATE MATS, patented June 10, 1958 by Walter F. Newhouse, Benton Harbor, Mich.

The method includes arranging cleats in parallel spaced relation at one station, continuously advancing the cleats along a flat surface to other successive stations, continuously feeding wires onto the cleats, continuously arranging at least a pair of slats over the cleats and the wires at another successive station, continuously fastening the cleats, slats and wires together in another successive station, and automatically cutting the wires at predetermined intervals to separate the mats from each other, after the completion of the fastening operation.

★ ★ ★

No. 2,838,075, WIRE FLATTENING, HOOKING, AND FEEDING DEVICE, patented June 10, 1958 by Roger M. Terry, Ipswich, and Roland M. Gardner, Swampscott, Mass., assignors to Sylvania Electric Products, Inc., Salem, Mass., a corporation of Massachusetts.

This device is for association with a stem machine having a number of heads for supporting stem elements and movable to a number of work stations.

★ ★ ★

No. 2,838,165, DEVICE FOR HOLDING COILS OF STRIP METAL, patented June 10, 1958 by Alvin Frank Groll, Napoleon, Ohio.

The machine is adapted to support coils of various widths and of various weights, with counterbalancing devices for the coil weights being provided.

★ ★ ★

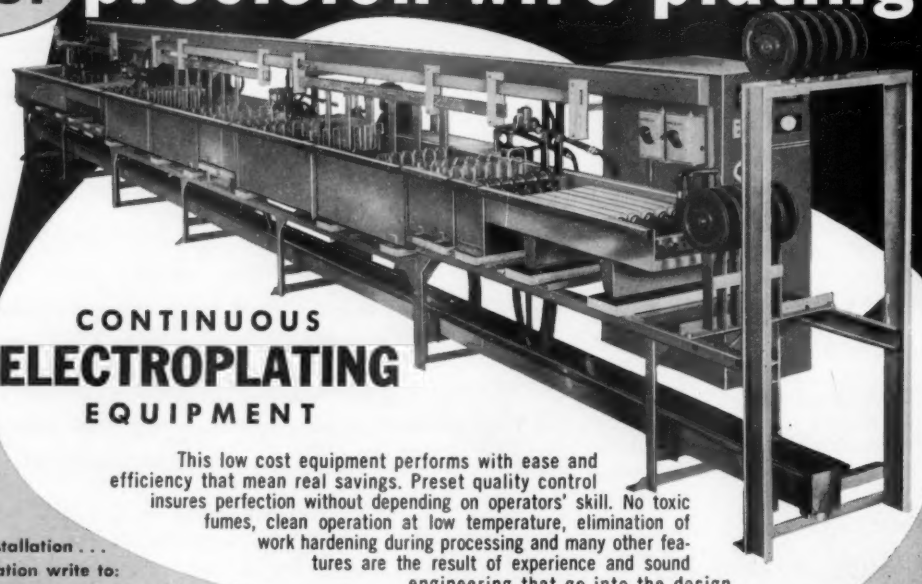
No. 2,838,172, WIRE PACKAGE AND METHOD OF FORMING, patented June 10, 1958 by Robert H. Prindle, Palmetto, Fla.

The free end of the wire from the wire supply is fed axially through a spirally wound coil spring and formed into generally annular convolutions. After the wire is separated from the supply, the wire is stretched circumferentially of the wire coil for a major portion of the length of the latter and thereby exceeding the elastic limit of the coil spring so that it will remain in the stretched condition.

★ ★ ★

No. 2,838,817, PAPER CLIP DEVICE, patented June 17, 1958 by David V. Wills, Philadelphia, Pa.


LOW COST precision wire plating



MAINTAIN UNIFORM COATINGS AT HIGH SPEEDS!

CONTINUOUS ELECTROPLATING EQUIPMENT

This low cost equipment performs with ease and efficiency that mean real savings. Preset quality control insures perfection without depending on operators' skill. No toxic fumes, clean operation at low temperature, elimination of work hardening during processing and many other features are the result of experience and sound engineering that go into the design of all Universal equipment.

We furnish complete installation . . .
For further information write to:

UNIVERSAL INDUSTRIAL EQUIPMENT CO.
SECAUCUS, NEW JERSEY SOLE AGENT IN CANADA: E. V. LARSON CO., LTD., TORONTO, CANADA

U. S. PATENT #2823180 AND FOREIGN PATENTS PENDING

The clip is constructed of a single length of wire including two coiled springs.

★ ★ ★

No. 2,839,090, WIRE CLOTH LOOM, patented June 17, 1958 by Clarence Eugene Webber and Lester K. Watson, Jr., York, Pa., assignors to New York Wire Cloth Company, York, Pa., a corporation of Delaware.

More specifically, the invention resides in a selvage forming mechanism for wire cloth looms. There are 25 claims.

★ ★ ★

No. 2,839,187, BULK ROLL OF ZIG-ZAG SPRING WIRE AND METHOD OF MAKING SAME, patented June 17, 1958 by Harry H. Norman and Harry B. Sklar, Los Angeles, Calif., assignors to Zig Zag Spring Company, Los Angeles, Calif., a partnership.

The spring wire is wound so that the outermost convolutions of the roll have a radius of curvature greater than the radius of curvature of the arch of the spring wire when in unstressed condition so that these convolutions tend to contract against inner convolutions therebeneath.

★ ★ ★

No. 2,839,202, TOWEL AND/OR WASH CLOTH HOLDER, patented June 17, 1958 by Alfred E. Arnett, Wichita, Kans.

The holder is constructed of lengths of wire, formed into a base, upright and tier of horizontally-disposed wire loops.

No. 2,839,258, WIRE WINDING SPOOL MECHANISM, patented June 17, 1958 by Delbert G. Jacobson, Castlewood, S. Dak.

This inventor provided a collapsible winding spool including stationary and movable segments and a guide rod which is actuated by a bell-crank to collapse or expand the movable segments relative to the stationary segment.

★ ★ ★

No. 2,840,118, WIRE CRIMPING AND CUTTING MECHANISM FOR BED SPRING MACHINES, patented June 24, 1958 by Charles H. Gail, Los Angeles, Calif., assignor to Spring Machinery Company, Los Angeles, Calif., a corporation of California.

There are 13 claims to this patent for crimping and severing mechanisms for machines for producing bed springs formed of rows of spring coils and helices connecting adjacent portions of the upper and lower turns of the spring coils of adjacent rows.

## New Cable Jacketing Material

A new, tougher and lighter extruded tubing for jacketing coaxial, umbilical and other cables has been announced by the **Borden Chemical Company.**

★ ★ ★

**Known** as Resinite EP-145, the new polyvinyl chloride material is described as "an improved equivalent of Specification MIL-R-6855, Class II, Grade 60, synthetic rubber."

★ ★ ★

**The** product is reported to have from 11 to 31 times the abrasion resistance of neoprene at various test cycles and it is considerably lighter than neoprene. Its lower specific gravity, higher tensile strength, and greater abrasion resistance permit thinner walls and the use of less material.

★ ★ ★

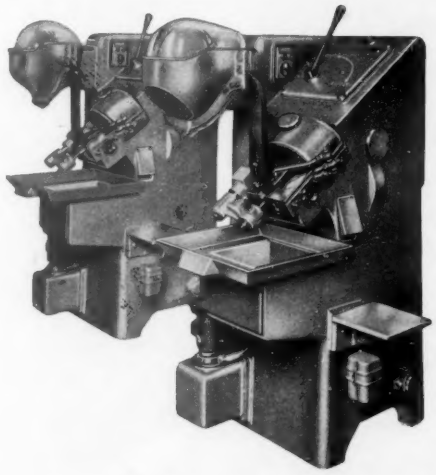
**Resinite** EP-145 does not deteriorate from exposure, according to Borden technicians. On the contrary, they state, exposure increases its tensile strength.

★ ★ ★

**The** new material has unusual low-temperature, cold-bend, and impact strength. It remains flexible at temperatures below minus —100 degrees F.


EW

ALL MACHINES FOR PRODUCING AND WORKING THE METALLIC WIRES



High-speed Nut Tapping Machines for hexagon and square nuts up to ½"

Model "EW118-120-122"

*Please, contact us.*

Emilio Wartenweiler

MILANO (ITALY)
VIA G. B. PERGOLESI No. 18

**Flame** resistant and self-extinguishing, Resinite EP-145 also surpasses requirements for hot-air aging, hot oil, and hot water immersions.

★ ★ ★

**Information** will be supplied by the Borden Chemical Company, Resinite Department, at plants in North Andover, Mass., and Santa Barbara, Calif.

## Nickel Coated Titanium Wire Developed by Little Falls Alloys For Ceramic to Metal Bond

**Little Falls Alloys** of 189 Caldwell Avenue, Paterson, New Jersey, has recently announced the availability of a new special purpose wire for use primarily as a material for ceramic to metal brazing.

★ ★ ★

**The** wire is nickel coated titanium and its primary application is its use as a sealing material for ceramic base vacuum tubes. The alloy will melt to bond with the ceramic, forming a perfect air-tight seal.

★ ★ ★

**The** wire is composed of approximately 71½% titanium, 28½% nickel, and is presently available in sizes from .062 to .004.

★ ★ ★

**Further** information may be obtained by writing directly to Little Falls Alloys, Inc. of 189 Caldwell Avenue, Paterson, N. J.

## Rubber Company Issues New Brochure

A facilities brochure entitled "Adventures in Rubberland" is now available for distribution according to Minnesota Rubber President, **Robert W. Carlson.** The sixteen page folder describing **Minnesota Rubber Company's** manufacturing facilities is printed on heavy paper in 4 colors. The story is entertainingly told by a cartoon character called "Quadee," who is a takeoff from the company's Quad®Ring Seal design.

★ ★ ★

**"Quadee"** takes the reader on a trip through the plant describing each of the individual plants in detail. It starts with a visit to the general offices, then to the Research and Development division, the Black Magic Plant, the Silicone plant, the Plastic and Latex Plant, the Rainbow Plant, and finally the engineering plant.

★ ★ ★

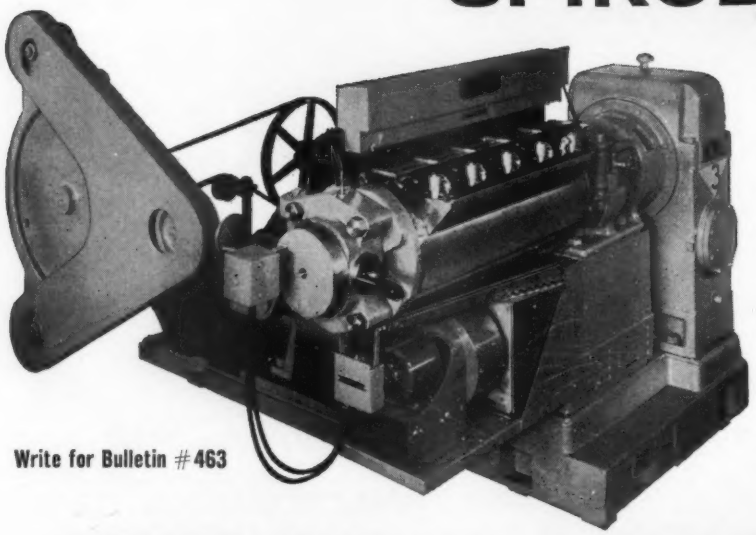
**Copies** of "Adventure in Rubberland" may be obtained by writing to: Minnesota Rubber Company, 3630 Wooddale Ave., Minneapolis 16, Minn.

## New Worm Gear Drive Bulletin

A new eight-page, illustrated booklet—Why Worm Gear? Why Cleveland?—provides useful information on worm gearing in general, points out the advantages of


ROYLE

SPIROD® for Rubber or Plastic Wire Insulating



Write for Bulletin #463

**These all electric extruders with radiant heat and high velocity evaporative cooling are designed to process either plastic or rubber compounds. The result of more than three quarters of a century of experience — Royle pioneered the extrusion process in 1880— in the design and construction of extruding machines time tested features have been built into Spirod to assure dependability.**

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England — James Day (Machinery) Ltd. — Hyde Park 2430 - 0456

Home Office — V. M. Hovey J. W. VanRiper — SHerwood 2-8262

Akron, Ohio — J. C. Clinefelter Co. — BLackstone 3-9222

Downey, Cal. — H. M. Royal, Inc. — TOpax 1-0371

Tokyo, Japan — Okura Trading Co., Ltd. — (56) 2130 - 2149

this type of gearing and gives pertinent design and manufacturing facts.

★ ★ ★

**Designated** Bulletin 150, the booklet is available upon request to the manufacturer, **Cleveland Worm & Gear Co.,** 3249 East 80th Street, Cleveland 4, Ohio.

## Research Firm Expands

**Metals Research And Development, Inc.** of Exeter, Pennsylvania, announces that it is expanding its fabricating facilities by one third. This involves the addition of a new pilot plant area. Within this area, metal powder rolling facilities will be built and operated. The firm specializes in metallurgical research and development with heavy emphasis on new fabrication techniques as well as new product development. The company is headed by **Samuel Storchheim,** President and Technical Director.

## Mylar Film Gets UL Approval for Building Wire

**Use** of one-mil "Mylar" polyester film, type A, to replace certain materials in building wire and service entrance cable has been approved by Underwriters' Laboratories.

★ ★ ★

**The** Underwriters' sanction extends the cost-saving advantages of "Mylar" to the field of relatively inexpensive cables, according to **W. B. Davis,** manager of industrial sales for **Du Pont's** Film Department.

★ ★ ★

**In** the building wire application, a one-mil tape of "Mylar" has been approved for use over previously vulcanized rubber insulation and under an asphalt-pitch impregnated cotton braid in cables No. 8 AWG and larger, which are produced in continuous vulcanizers. In this application "Mylar" replaces a rubber-filled cotton tape.

**In** the service entrance cable applications, approval was granted for use of one-mil "Mylar" over the stranded neutral conductors and under the outer braid when type RHW (heat- and moisture-resistant) insulation is used on the insulated conductor.

★ ★ ★

**The** UL has indicated it will extend approval to any manufacturer using constructions similar to those described upon application.

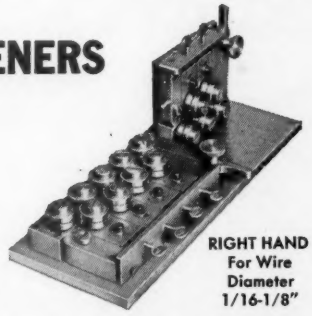
## Bethlehem Opens New Rope Depot in South

**Bethlehem Steel Company** has opened a new Wire Rope Mill Depot, Asbury Ave. at Toal St., Charlotte, N. C.

★ ★ ★

**The** Depot will stock a full line of Bethlehem's wire rope, slings and other spliced products in order to further improve the service to Bethlehem's distributors and other jobbers in North Carolina and adjacent areas. It will be equipped to cut and coil all sizes of wire rope.

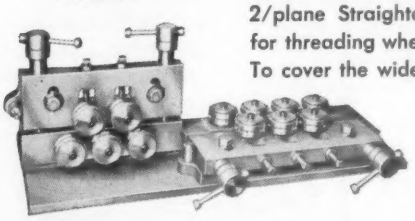

Sjogren 2 PLANE ROLL STRAIGHTENERS



RIGHT HAND For Wire Diameter 1/16-1/8"

Sjogren Two Plane Roll Straighteners are fully ball bearing for heavy production duty. They are designed to accommodate all sizes and grades of round or shaped wire whether it be high carbon, low carbon or copper, as well as the many alloys, from .010" to .375". Once set for the job at hand Sjogren 2/plane Straighteners may be opened and closed for threading when making coil changes without effecting the adjustment of the setting. To cover the wide range of wire diameters there are several size groups manufactured with either left or right hand direction. Each is individually produced to exact specifications for the grade, size and type of wire to be processed. Sjogren Two Plane Roll Straighteners do their duty each day, every day in the year.

LEFT HAND For Wire Diameter 3/16-3/8"



Sjogren TOOL & MACHINE CO., INC. SINCE S&S 1922

WIRE PULLERS • WEDGE GRIPS • JAWS FOR ALL MAKES OF PULLERS AND TESTING MACHINES • CAGE ROLLERS • SWAGING HAMMERS • POINTING DIES • WIRE SPOOLERS

*Used by Wire Men Who Want the Best!*

14 SWORD ST. • AUBURN, MASS.

### Finds Wire Superior in Many Product Applications

**Steel** wire offers almost unlimited possibilities for reducing production costs and improving the performance and appearance of a wide variety of finished products and component parts.

★ ★ ★

**On** this premise, **E. H. Titchener & Co.**, Binghamton, N. Y., has built a unique and thriving business. The company specializes in the design and fabrication of wire. Its sales engineers constantly search for ways to improve the products of other manufacturers by incorporating components made of wire.

★ ★ ★

**In** helping International Business Machines redesign an IBM time card rack, Titchener engineers demonstrated the advantages of their services to industry. By changing the rack design from sheet steel to steel wire, metal requirements for the rack were cut two-thirds. The wire rack also is stronger, easier to keep clean because dust and dirt cannot accumulate in the individual card holders, better looking, and more resistant to rust because it is spray painted inside and out. It was constructed of J & L's extra clean, bright steel wire.

★ ★ ★

**The** time card rack is made up of 84 pieces of wire assembled by 300 electric spot welds. Each of the 26 card separators consists of three pieces of 13-gage wire. These are welded to four 3/16-inch diameter wires, 26 inches long, forming the rack frame. Two sheet metal side channels are welded to the frame. Wall-mounting loops welded on top and bottom of rack also are made of 3/16-inch wire.


**INCREASE PRODUCTION . . . . .**

**REDUCE OPERATING COSTS . . . . .**

**With the**

# New Whitacre

**WIRE DRAWING and GALVANIZER**

# DEAD BLOCKS

**YOU GET THESE ADVANTAGES:**

- **No stopping for stripping.**
- **No tangling nor snarling from handling.**
- **Permits packaging into stationary container or uninterrupted palletizing on stems.**
- **Greatly reduced floor space requirements.**
- **Design simplicity. No back-gearing nor similar mechanisms.**
- **Low capital investment—low maintenance.**

# WHITACRE

**ENGINEERING & MANUFACTURING COMPANY**

**1512 W. COMMONWEALTH AVE. • ALHAMBRA, CALIF.**

**Telephone: CUmberland 3-7053**


### Rivet Manufacturer Offers New Bulletin

A four-page brochure illustrating new, custom-made rods is available from **Brainard Rivet Co.**, Girard, Ohio, producers of cold-headed fasteners and special cold formed parts for industry.

★ ★ ★

**The** folder lists data on available lengths, diameters, thread lengths, head styles and sizes, and materials used to produce custom-made rods. Illustrations cover a variety of custom-made rods, standard fasteners and special parts produced on equipment recently installed in the Brainard plant. Write Brainard Rivet Co., Girard, Ohio, for a copy.

### New Platform Truck for Mills

**The Prime-Mover Co.**, Muscatine, Iowa, has announced a new 4,000 lb. capacity platform truck with a hydraulic torque converter transmission. The new unit is powered by an 18 h.p., 2 cylinder, air cooled engine and features automotive type steering, dual front wheels, heavy industrial drive wheels and a spin-proof differential.

★ ★ ★

**The** truck is controlled by a two position directional change lever, an accelerator, and a brake. The three element hydraulic torque converter transmission eliminates clutching and shifting, permits fast smooth starts and provides a

continuous flow of power to meet any load condition. Driver fatigue and mechanical maintenance are reduced to a minimum.

★ ★ ★

**The** unit, designated Prime-Mover Model F40, has a 42″ wide flat bed that measures 78″ long behind the engine enclosure. The space at the right of the engine for handling long bar stock, pipe, lumber, etc. is 21″ wide and 122″ long.

★ ★ ★

**Engineered** to meet the requirements for a heavy duty platform type burden carrier, the truck has the stability and ruggedness to withstand severe and continuous heavy duty operating conditions.

### Enters Thin Gauge Metal Strip Field

**With** the completed installation of their new, automatic, electronically controlled strip annealer, **The Seymour Manufacturing Co.,** Seymour, Conn., is now producing their specialized products, Nickel Silver, Phosphor Bronze, Brass and other alloys down to .001″ in a wide range of commercial widths. Seymour, a leader since 1878 in the non-ferrous strip, rod and wire field, geared itself for the increased demand for ultra thin gauge strip by an initial million and one half dollar capital expenditure for a Sendzimir reversing mill to bring strip down to finish gauges with closer tolerances than the industry had known. The Sendzimir also produces the highest standard of surface finish obtainable.

### Wire Cloth Sample Kit Available

**A** newly-prepared sample kit, illustrating the wide range of wire cloth available for modern industrial applications, is available from **Michigan Wire Cloth Company.**

★ ★ ★

**With** wire cloth being used in practically every branch of mass production materials, the sample kits provide a quick and convenient reference to the nature of various types and weaves of standard Michigan Wire Cloth products.

★ ★ ★

**One** section of the kit contains swatches of square-weave wire cloth, ranging from 10 mesh to 120 mesh. The other section contains representative samples of Dutch weave metal filter cloth, ranging from 110 mesh to 700 mesh. Materials used in weaving the cloth are brass, aluminum, monel, pure nickel and stainless steel.

★ ★ ★

**Areas** of application possible with the complete line of wire cloth cover everything from screening aggregates to low-micron filtration in fuel filters for engines, gas turbines, and missiles. The kits are available in limited numbers without charge from Michigan Wire Cloth Company, 2100 Howard, Detroit 16, Mich.

**Get the habit of reading regularly**
**WIRE AND WIRE PRODUCTS**
**The Wire Man's Magazine**

*Another Development ... by Hubbard!*

**PLYWOOD MARRIES STEEL**

**FOR BETTER SHOP REELS**

RESULTING IN

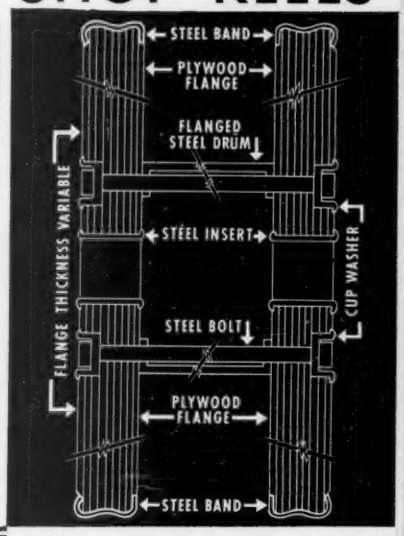
1 GREATER IMPACT STRENGTH

2 LOWER MAINTENANCE COSTS

3 LIGHTER WEIGHT FOR EASIER HANDLING

4 CAN BE SUBMERGED IN WATER

5 WIDE RANGE OF SIZES




**LOWER INITIAL COST**

FOR DETAILS CONTACT

**HUBBARD SPOOL DIVISION**

*The American Pulley Company*

GARRETT, INDIANA

COPPER. - Refined metals consumed in mill products 1/ in 1957 and in 1958, by months, and stocks of refined copper at end of period, gross weight in short tons

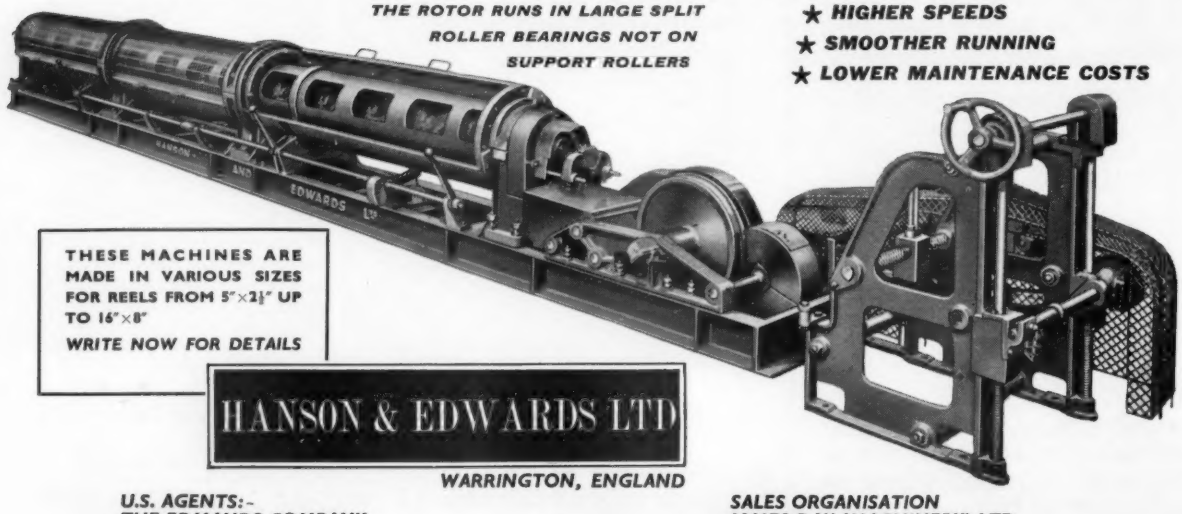
| Period | Consumption | | | | | | Stocks of refined copper | |
|---|---|---|---|---|---|---|---|---|
| | Wire mills | Brass mills | | | | | | |
| | Refined copper 2/ | Refined copper 2/ | Refined Lead | Primary pig tin | Refined nickel | Slab zinc | Wire mills | Brass mills |
| 1957------- | 775,080 | 535,951 | 2,476 | 947 | 4,312 | 101,047 | 52,680 | 50,337 |
| 1958: | | | | | | | | |
| January-- | 60,238 | 40,434 | 206 | 76 | 315 | 8,059 | 58,856 | 47,518 |
| February- | 54,311 | 34,534 | 167 | 44 | 251 | 6,560 | 59,036 | 45,754 |
| March---- | 55,531 | 34,076 | 151 | 48 | 352 | 6,184 | 63,890 | 49,597 |
| April---- | 54,994 | 33,082 | 122 | 44 | (3) | 5,682 | 64,638 | 49,132 |
| May------ | 49,270 | 32,156 | 163 | (3) | (3) | 5,958 | 64,308 | 48,167 |

1/ Data cover operations of 18 wire mills and 60 brass mills.
2/ Detailed information on consumption of refined copper is published in the Monthly Copper Report.


ROLLER BEARING
TYPE TUBULAR
STRANDING MACHINE
(EITHER SINGLE OR DOUBLE CAPSTAN)

THE ROTOR RUNS IN LARGE SPLIT ROLLER BEARINGS NOT ON SUPPORT ROLLERS

★ HIGHER SPEEDS
★ SMOOTHER RUNNING
★ LOWER MAINTENANCE COSTS




THESE MACHINES ARE MADE IN VARIOUS SIZES FOR REELS FROM 5"×2½" UP TO 16"×8"
WRITE NOW FOR DETAILS

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WARRINGTON, ENGLAND

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LONDON, W.1.

P 1686

AMERICAN IRON AND STEEL INSTITUTE
150 EAST FORTY-SECOND STREET, NEW YORK 17, N. Y.

AIS 10

Total Number of Companies Included 124

APRIL - 1958
Month

## SHIPMENTS OF STEEL PRODUCTS
## ALL GRADES INCLUDING CARBON, ALLOY AND STAINLESS
(Net Tons)

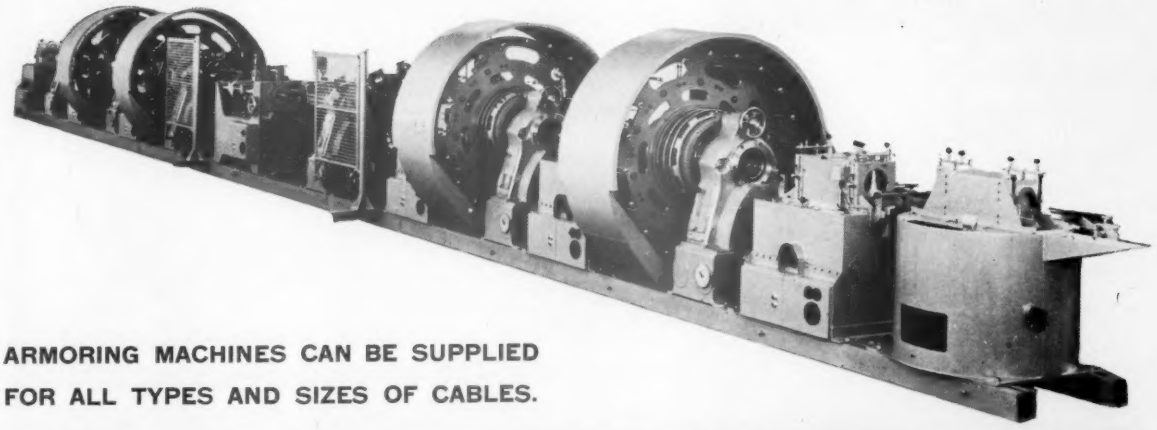
Covering Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or for Resale)

| Steel Products | Items | CURRENT MONTH 1958 Carbon | Alloy | Stainless | Total | Percent of Total Shipments | Prior Year (1957) Percent of Total Shipments | YEAR TO DATE * 1958 Carbon | Alloy | Stainless | Total | Percent of Total Shipments | Prior Year (1957) Percent of Total Shipments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingots and Steel Castings | 1A | 11,464 | 11,361 | 2,516 | 25,341 | 0.6 | 0.6 | 46,637 | 44,046 | 8,014 | 98,697 | 0.5 | 0.6 |
| Blooms, slabs, billets, sheet bars | 1B | 62,762 | 17,453 | 1,476 | 81,691 | 1.9 | 2.9 | 303,138 | 88,548 | 4,924 | 396,610 | 2.2 | 3.0 |
| Tube rounds | 1C | 596 | 177 | 6 | 779 | - | 0.1 | 1,978 | 801 | 8 | 2,787 | - | 0.1 |
| Skelp | 2 | 9,985 | - | - | 9,985 | 0.2 | 0.2 | 29,874 | - | - | 29,874 | 0.2 | 0.2 |
| Wire rods | 3 | 59,126 | 903 | 570 | 60,599 | 1.4 | 1.1 | 244,352 | 4,341 | 1,773 | 250,466 | 1.4 | 1.2 |
| TOTAL SEMI-FINISHED | | 143,933 | 29,894 | 4,568 | 178,395 | 4.1 | 4.9 | 625,979 | 137,736 | 14,719 | 778,434 | 4.3 | 5.1 |
| Bars—Hot rolled (incl. light shapes) | 14 | 308,908 | 64,859 | 2,434 | 376,201 | 8.6 | 9.4 | 1,291,530 | 327,318 | 10,684 | 1,629,532 | 8.9 | 9.9 |
| Bars—Reinforcing | 15 | 175,637 | - | - | 175,637 | 4.0 | 2.9 | 541,570 | - | - | 541,570 | 3.0 | 3.0 |
| Bars—Cold finished | 16 | 58,459 | 9,001 | 3,165 | 70,625 | 1.6 | 1.6 | 257,603 | 43,113 | 13,234 | 313,950 | 1.7 | 1.7 |
| Tool steel | 17 | 692 | 4,987 | - | 5,679 | 0.2 | 0.1 | 2,850 | 20,802 | - | 23,652 | 0.1 | 0.1 |
| TOTAL BARS AND TOOL STEEL | | 543,696 | 78,847 | 5,599 | 628,142 | 14.4 | 14.0 | 2,093,553 | 391,233 | 23,918 | 2,508,704 | 13.7 | 14.7 |
| Wire—Drawn | 23 | 175,482 | 2,135 | 1,620 | 179,237 | 4.1 | 3.0 | 675,719 | 10,719 | 6,542 | 692,980 | 3.8 | 3.1 |
| Wire—Nails & staples | 24 | 36,411 | - | 2 | 36,413 | 0.8 | 0.5 | 130,264 | - | 6 | 130,270 | 0.7 | 0.5 |
| Wire—Barbed & twisted | 25 | 7,237 | - | - | 7,237 | 0.2 | 0.1 | 23,297 | - | - | 23,297 | 0.1 | 0.1 |
| Wire—Woven wire fence | 26 | 21,629 | - | - | 21,629 | 0.5 | 0.4 | 69,084 | - | - | 69,084 | 0.4 | 0.3 |
| Wire—Bale ties & baling wire | 27 | 6,429 | - | - | 6,429 | 0.1 | 0.1 | 13,121 | - | - | 13,121 | 0.1 | 0.1 |
| TOTAL WIRE & WIRE PRODUCTS | | 247,188 | 2,135 | 1,622 | 250,945 | 5.7 | 4.1 | 911,485 | 10,719 | 6,548 | 928,752 | 5.1 | 4.1 |
| Sheets—Hot rolled | 31 | 368,741 | 16,978 | 1,552 | 387,271 | 8.9 | 9.3 | 1,668,715 | 70,343 | 8,898 | 1,747,956 | 9.5 | 10.0 |
| Sheets—Cold rolled | 32 | 616,615 | 3,033 | 8,339 | 627,987 | 14.4 | 12.3 | 2,869,043 | 11,420 | 32,105 | 2,913,368 | 15.9 | 14.2 |
| Sheets—Galvanized | 33 | 206,368 | - | - | 206,368 | 4.7 | 2.7 | 756,813 | - | - | 756,813 | 4.1 | 2.8 |
| Sheets—All other coated | 34 | 10,588 | - | - | 10,588 | 0.2 | 0.2 | 51,662 | - | - | 51,662 | 0.3 | 0.2 |
| Electrical sheets & strip | 35 | 1,889 | 34,035 | - | 35,924 | 0.8 | 0.8 | 12,131 | 136,064 | - | 148,195 | 0.8 | 0.8 |
| Strip—Hot rolled | 36 | 61,357 | 1,308 | 680 | 63,345 | 1.4 | 1.6 | 277,866 | 5,360 | 2,489 | 285,715 | 1.6 | 1.8 |
| Strip—Cold rolled | 37 | 54,609 | 1,870 | 7,926 | 64,405 | 1.5 | 1.3 | 260,413 | 7,565 | 41,718 | 309,696 | 1.7 | 1.5 |
| TOTAL SHEETS AND STRIP | | 1,320,167 | 57,224 | 18,497 | 1,395,888 | 31.9 | 28.2 | 5,897,443 | 230,752 | 85,210 | 6,213,405 | 33.9 | 31.3 |
| TOTAL SHIPMENTS (1958) | | 4,106,985 | 232,064 | 33,922 | 4,372,971 | 100.0 | xxx | 17,108,149 | 1,065,733 | 145,665 | 18,319,547 | 100.0 | xxx |
| TOTAL — PRIOR YEAR (1957) | | 6,864,901 | 426,594 | 58,257 | 7,349,752 | xxx | 100.0 | 27,998,470 | 1,786,498 | 244,429 | 30,029,397 | xxx | 100.0 |

* Revised


ARMORING UNITS FOR A 60 BOBBIN WIRE AND STEEL TAPE ARMORING MACHINE

FOR CABLES UP TO 7" (180 mm) DIAMETER.



ARMORING MACHINES CAN BE SUPPLIED
FOR ALL TYPES AND SIZES OF CABLES.

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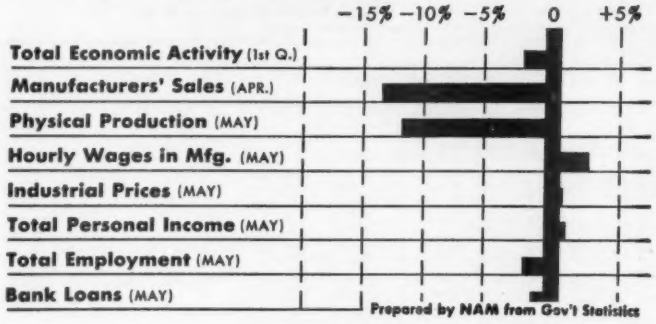
HANCOR, INC., 468 Fourth Ave., New York 16, N. Y.
SOLE REPRESENTATIVE IN THE U.S.A. AND CANADA

NEWS-FACTS ON ECONOMIC CONDITIONS–

## UP OR DOWN — AT A GLANCE

Latest Data Compared with Year Ago


−15% −10% −5% 0 +5%
Total Economic Activity (1st Q.)
Manufacturers' Sales (APR.)
Physical Production (MAY)
Hourly Wages in Mfg. (MAY)
Industrial Prices (MAY)
Total Personal Income (MAY)
Total Employment (MAY)
Bank Loans (MAY)
Prepared by NAM from Gov't Statistics

### 1958 Buhova Trade Letter Available

**The** Commercial Intelligence Office of the **Bureau Voor Handelsinlichtingen,** 16 Oudebrugsteeg, Amsterdam C. Holland, has issued its 1958 Buhova Trade Letter listing export agents, importers and other firms concerned with compensation, reciprocity, shipping, banking, trade journals, newspapers, and others concerned with the sale of products abroad.

★ ★ ★

**The** Bureau will be glad to mail a copy of this letter to interested persons upon request. Various types of products are listed, with reference numbers that identify the firms who can handle them.

### Folder On Teflon Wires

**Chemplast, Inc.,** 3 Central Avenue, East Newark, N. J., announces the publication of a 4-page brochure on its line of "Teflon"-coated wire. The brochure (Fact Sheet No. 2) gives sizes available, new engineering data, pointers on wire and cable design with "Teflon," and typical uses of "Teflon"-coated wire made by Chemplast.

★ ★ ★

**Chemplast** produces wire-coatings of "Teflon" TFE-fluorocarbon resin in wall-thicknesses from 0.030" to 0.225". Coatings are applied to wire by the company's specially developed process, employing conventional granular "Teflon." According to Chemplast, this process provides an exceptionally high degree of concentricity, controlled tightness of coating to wire, and high density.

★ ★ ★

**Copies** of the booklet may be obtained by writing to Chemplast at the above address.


**GREATER FLEXIBILITY IN WIRE STRAIGHTENING AND CUTTING WITH VARIABLE SPEED DRIVE**

*. . . in a low cost machine*

- Select-O-Speed Drive permits selection of infinitely variable feed speeds from 25 to 155 FPM for all types of wire and rod.
- Available with super-sensitive electric trip mechanism.
- High-Speed Five-Die Straightener Arbor, mounted on ball bearings.
- Lewis engineered, simple, rigid, dependable . . . of best materials and workmanship.
- Ideal for manufacturers of stove and refrigerator racks, lamp shades, wire baskets, garment hangers, welding rod and other products where small diameter wire is used.

Lewis 1-C Automatic Wire Straightening and Cutting Machine. 1/16" to 1/8" capacity.

For further information write:

**THE LEWIS MACHINE COMPANY**

**3441 EAST 76TH STREET • CLEVELAND 27, OHIO**

## Producing Teflon-Insulated Wires

**Oxygen-free,** high-conductivity copper, a decisive factor in the development of the electronic industry, is now being processed into teflon-insulated wire and cable by **Aero-Marine Development Corporation,** 110 Summit Ave., Chatham, N. J.

★ ★ ★

**OFHC*** copper is a superior grade; the pure copper content being in the order of 99.99%. The absence of extraneous inclusions considerably improves ductility, provides higher electrical and thermal conductivity, increases impact strength and creep resistance and produces immunity to deterioration when heated. These remarkably improved physical characteristics are particularly significant where end use will be under high temperature conditions.

★ ★ ★

**The** pure copper metal is universally accepted as a particularly high-grade metal and has been used extensively throughout the electronic and aircraft industries. The Aero-Marine Development Corporation, however, is the first teflon wire manufacturer to use OFHC copper exclusively for all production. The company will make teflon-insulated OFHC copper wire and cable available to industry at no advance in prices.

★ ★ ★

A detailed bulletin is available.

* Registered trademark, American Metal Company, Ltd.

## Circular Slide Rule Offered

**General Industrial Co.** has introduced a handy circular Slide Rule for engineers and for other plant and office executives. Any executive who must perform simple calculations will find this convenient, pocket-size calculator extremely useful in his work.

★ ★ ★

**Operation** of the rule is simple and the results are accurate. To multiply, divide and find proportions is easy and exceptionally fast with this convenient circular rule. Complete easy-to-follow instructions will be included with each slide rule.

★ ★ ★

**For** your free Circular Slide Rule, write to General Industrial Co., 5738 Elston Ave., Chicago 30, Illinois. To readers who do not qualify as an engineer or business executive, General Industrial Co. will be pleased to send one for 50¢.

## To Have New Cable Plant

**Continental Copper & Steel Industries, Inc.** has sold the property and assets of its Woolridge Division to Curtis-Wright Corp. and will build a new plant in Linden, N. J., for the manufacture of rubber covered wire and cable for its **Hatfield Wire and Cable Division.**

★ ★ ★

**The** new plant will cost around $3.5 million according to **M. S. Gordon,** President. This project will complete the company's expansion program, which included substantial improvements to the company's Braeburn, Pa., Hanover, Pa., and Union, N. J., plants.

KEEP COOL!

DON'T GET BURNED THIS HOT SUMMER WITH SPOOL PROBLEMS...

Boonton's "PLASTISPOOLS" are dropping temperatures everywhere with five sizes of plastic spools that are

- RUGGED
- ONE PIECE
- LIGHT WEIGHT
- CRUSH AND WARP RESISTANT

A PHONE CALL OR LETTER WILL BRING SAMPLES AND PRICES FROM

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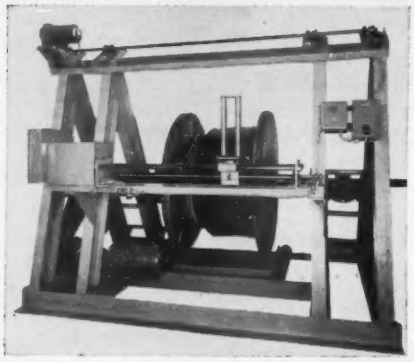
# LARGE REEL TAKE-UP

**FOR USE WITH OUR LARGE FOUR-WIRE TWISTING MACHINES OR PLANETARY CABLERS**



Made in sizes to accommodate reels up to 84 inches in diameter.

It is an arborless type. The driving shaft is hollow, with an extensible solid shaft that centralizes the reel and drives it. The idle shaft is moveable back and forth by means of a gear and rack, controlled by a hand wheel.

The reel to be loaded is placed on the loading platform, rolling in machined ways and is pushed onto the driving shaft by the idle shaft and hand wheel.

The reel is lifted to the operating position by four motor driven enclosed lifting screws, equipped with limit switches.

The traverse mechanism is a single screw, reversed by Warner Clutches and having its rate of lay controlled by change gears. It can be positioned and moved by hand.

The reel is driven by a Louis Allis Adjusto Spede Drive coupled to a four speed Drive-All Unit, to give constant tension on the cable being taken up.

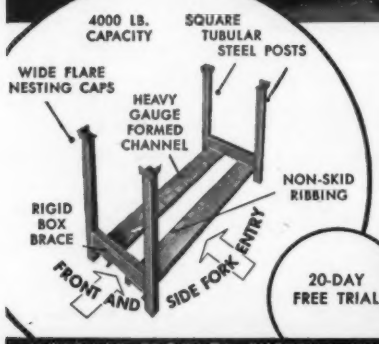
Write for further information.

**THE EDMANDS CO.** 860 WELLINGTON AVE., CRANSTON 10, R. I.



**JARKE**
PORTABLE
**WIRE COIL RACKS**

COURTESY HOLO-KROME SCREW CORP.




**Solve Wire Coil Storage Problems**

Makes handling and storing of unwieldy wire coils a simple one-man operation. Improves plant housekeeping, saves space, provides positive inventory control. Front and side fork entry permits closer stacking and greater maneuverability in narrow aisles. Saves time, labor, cuts costs. Standard and special sizes.

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MODULAR STORAGE SYSTEMS FOR METAL INDUSTRY • STEELMOBILE



**EXTRA COPIES OF THE BUYER'S GUIDE AVAILABLE FOR $5.00 EACH**


## Approve Four Escambia PVC Resins For Electrical Use

**Four** of **Escambia Chemical Corporation's** polyvinyl chloride resins are now on the Underwriters Laboratories' interchangability list for electrical applications, according to a recent report by the testing organization.

★ ★ ★

**This** is the first time a series of four electrical grade resins have been offered to the wire and cable industry from one manufacturer, a company spokesman said. From this wide range of materials, the processor can select the molecular weight for the processing temperatures and operating speeds his production requires.

★ ★ ★

**Under** tests, these resins show outstanding insulation resistance and other excellent electrical properties. The resins are recommended for extrusion, calendering and molding of electrical products because of their extremely low gel count, free-flowing dry blends, uniform particle size, freedom from fines and outstanding heat stability.

★ ★ ★

**The** resins approved for electrical applications, in order of their molecular weight (highest to lowest) are: Escambia PVC 1250-E, Escambia PVC 1225-E, Escambia PVC 1200-E and Escambia PVC 1185-E.

## Brochure on Self-Dumping Hoppers

**A** new brochure, illustrating and describing their complete line of self-dumping hoppers has just been published by the **Apex Welding & Fabricating Corporation,** Bedford, Ohio.

★ ★ ★

**Engineered** for industrial truck handling, the hoppers can be used

for wet or dry materials, either hot or cold. They are designed to provide peak handling efficiency and eliminate driver fatigue.

★ ★ ★

**The** hoppers may be automatically dumped by releasing a specially designed gravity cam latch. After a load is dumped, the unit rights itself and locks in the closed position, smoothly and accurately.

★ ★ ★

**The** free literature describes the five models available with capacities from ½ yard to 2 yards. Application photographs and closeup product illustrations are used.

★ ★ ★

**Both** design and application information are covered in the text with complete specifications for all five models.

★ ★ ★

**Copies** of the 4-page brochure may be obtained from Apex Welding & Fabricating Corporation, 30 Interstate Street, Bedford, Ohio.

## The Steel Production Manuals

(*Continued from page* 878)

copies here to distribute but they didn't arrive. These manuals may also be obtained from the American Iron and Steel Institute, 150 East Forty-Second Street, New York 17, N. Y.

★ ★ ★

**Member:** You mentioned some of the different types of steel, rimmed, capped and killed. I didn't hear oxygen mentioned and I would like to find out more about that.

★ ★ ★

**Mr. Clements:** Do you mean steel produced by the basic oxygen process?

★ ★ ★

**Member:** Yes.

★ ★ ★

**Mr. Clements:** Well, I do not pose as an authority in this field, since this steel making process is not utilized by the Bethlehem Steel Company. There are a number of important factors which would determine whether this steel making process is used. One of the most important or primary reasons for using this process is an excess


**DANFORTH**

**FIRST QUALITY—PROPERLY-GRADED**

**DIAMOND POWDERS**

Will give you maximum • • •

*Value • Service • Economy*

For this you pay a little more in first cost, but you save in faster work, in superior die finish and in better wire drawn. DANFORTH POWDERS are uniform in purity, quality, grain shape and accuracy of grading.

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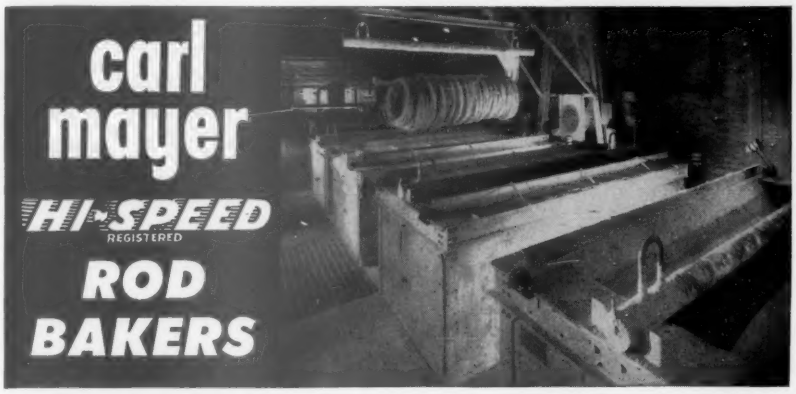
**The DANFORTH PROCESS of reclaiming produces powders that are *guaranteed* to be 99% or better pure.**

***Write today for information on diamond powders.***

**C. W. DANFORTH COMPANY**

**101 E. Indianola Ave.** Established in 1912 **Youngstown 7, Ohio**






**Faster baking, greater fuel economy, maximum production efficiency are just a few of the results of the exclusive heating arrangement of the Carl Mayer Hi-Speed Rod Baker. It also has a patented blow-off feature which removes moisture without damage to coils.**

**Here are just a few of our many satisfied customers:**

American Steel & Wire Co.
Atlas Steel Co.
Colorado Fuel & Iron Corp.
Crucible Steel Co. of America
Driver-Harris Co.
B. Greening Wire Co., Ltd.
Indiana Steel & Wire Co.
Jones & Laughlin Steel Corp.
Republic Steel Corp.
Sheffield Steel Div., Armco Steel Corp.
Steel Company of Canada

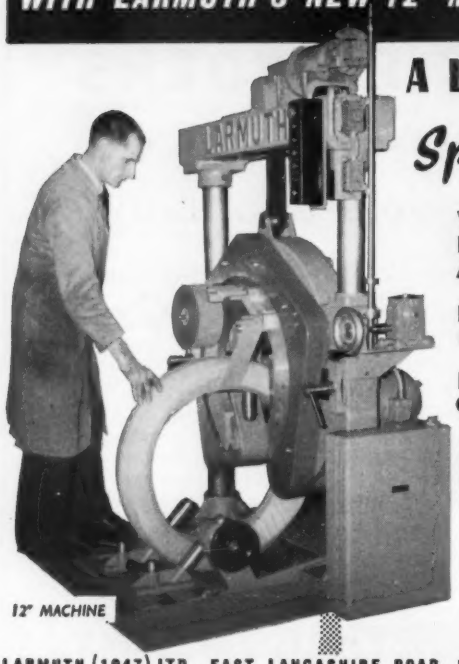
***Write for Bulletin No. 350***

**Patent Nos.**
**U. S. A.** 2,296,361 2,323,828 2,235,559
**Canada** 396,144 401,589

**THE carl mayer CORP.**
**20800 CENTER RIDGE RD., CLEVELAND 16, OHIO**

**OTHER PRODUCTS: Core Ovens • Mold Ovens • Welding Rod Ovens • Heat Treating Ovens & Furnaces • Special Processing Equipment and Accessories.**

HEAVY COIL WRAPPING MADE EASY
WITH LARMUTH'S NEW 12" MACHINE




12" MACHINE

A LARMUTH
Spiral Wrapping
MACHINE

WITH PATENT
MECHANICAL LOADING
AND EJECTION

FOR COILS UP TO
12" WIDE

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MACHINE CO., INC.
2231 E. Ontario Street
Philadelphia 34, Pa.

of blast furnace capacity resulting in a surplus of hot metal.

★ ★ ★

**Essentially** the basic oxygen process is quite similar to the acid Bessemer process as used in this country, except that oxygen is introduced into the converter instead of air as in the conventional Bessemer operation. Also, the refractory lining of the converter is basic instead of acid. The refining time is about the same as that of the Bessemer process, namely 20/30 minutes and depending upon the exact end use to which this type of steel may be put, it is our opinion that a satisfactory quality can be produced under the basic oxygen process. The same is true of the Bessemer process and because steel is produced in a short period of time, this feature does not necessarily preclude the fact that a high quality product cannot be produced.

★ ★ ★

**Certainly** there would be some instances where one might not recommend this type of steel, and similarly a Bessemer steel, but on the other hand we can think of some end uses where it might be expedient to use steel produced by this process instead of by some of the other well known processes.

★ ★ ★

**Some** companies have started production of steel by the basic oxygen process and of course the process requires the use of a great deal of oxygen, which is expensive, but we feel that there is a great deal of merit in this process and we are sure that it is going to become an increasingly important method of steel production in this country.

## New Radiant Tube Furnaces for Processing In Galvanizing and Patenting Lines

(*Continued from page* 887)

air patented and metallic patented rod and wire.

★ ★ ★

**As** shown in Figure 8, this furnace differs from the present

standard furnace in that it is a radiant tube fired vertical type patenting furnace, complete with lead quench bath and facilities to bypass the lead quench for air patenting.

★ ★ ★

**The** features of this design are:

1. **The floor space saving over the conventional 60 foot horizontal patenting furnace.**
2. **Radiant heat is applied completely around the wire with no contact of wire with metal, brick, or carborundum surfaces.**
3. **Complete atmosphere gas control for prevention of decarburization or loss of metal by excessive scaling. It would also be possible by using the correct type of atmosphere gas, to complete carbon restoration in this unit, if desired.**

★ ★ ★

**The** furnace is constructed as a two pass unit with two zones of temperature control.

★ ★ ★

**The** top rolls or roll, is of alloy construction and its speed is controlled by torque motors or motor. This torque motor eliminates tension on the wire flowing through the furnace.

★ ★ ★

**The** furnace is completely accessible by stairs and platforms, allowing accessibility to the burners and the top of the furnace. It is also possible the stairs could be eliminated and a single person hoist or elevator utilized.

★ ★ ★

**The** top section of this furnace is removable for easy access to the top roll for servicing the roll and for easy access during the initial stringing of wire through the furnace. It is proposed the stringing of this furnace would be accomplished by using a gang lead for a given group of wires. In the furnace of the size shown, probably three gang leads would be used for the initial stringing.

★ ★ ★

**Peep** sights are installed for a full view of the top of the rolls for checking wire tracking during normal operation. Access holes are also available for correcting cobbles or stringing individual wires

LOOK TO NOPCO FOR

TIMESAVING, MONEYSAVING CHEMICALS

*Pickling Bath Additives • Mold Lubricants • Corrosion Inhibitors*

*Dry Wiredrawing Compounds • Wet Wiredrawing Compounds*

Look to Nopco next time—every time—you order chemicals for your wiredrawing operations. Remember, with Nopco plants and warehouses strategically located across the nation, you are assured prompt delivery. And remember, too, Nopco has a wealth of technical experience in the application of these chemicals in the wiredrawing industry—has built its business by solving the problems of its customers. Our technical facilities and know-how are, of course, available to you—to help solve your particular problems. Simply write or telephone for complete information today. Nopco Chemical Company, Harrison, N.J.

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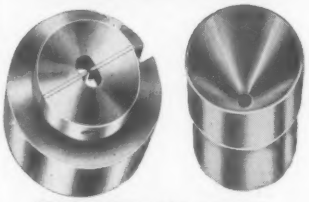
Highest Quality Workmanship and Materials. Standard Types and Special.



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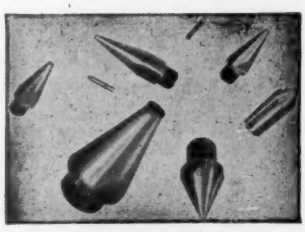

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BRIDGEPORT CARBIDE NOZZLES have phenomenally long life, will lower operating costs and reduce wire breakage.

BRIDGEPORT STEEL DIES are made in Round, Figure 8, Serrated, Tracer and other Special Shapes to your specifications. A newly designed Tru-Rip Die Assembly can be taken apart, cleaned, blades changed and reassembled quickly and easily. Made for 2 and 3 conductor wires to be coated in extrusion machines.

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## A NEW PACIFIC COAST FIRM TO SERVE

### ELECTRIC WIRE and CABLE & WIRE ROPE PRODUCERS

with dependable *used* wire and allied equipment west of the Mississippi and in the Pacific Coast Export Area.

A subsidiary of the well-known WIRE AND TEXTILE MACHINERY, INC. of Pawtucket, R. I., the company is headed by Paul I. Kenner, Pres., who has had 20 years of experience in the Wire Industry and with the home office.

A modern, well-equipped warehouse, with good rail and trucking facilities, will carry large stocks of equipment for prompt service.

- 5-48 CARRIER CABLE BRAIDERS
- 6-72" WATSON TAKE-UP STANDS
- 1-72" SYNCRO TAKE-UP STAND
- 3-4 PAD SYNCRO TAPING MACHINES

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FOR GOOD USED WIRE AND CABLE AND WIRE ROPE EQUIPMENT, WRITE

**WESTERN WIRE & TEXTILE MACHINERY, INC.**

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# Announcing

## The Completely NEW Robert J. Emory SPOOLER

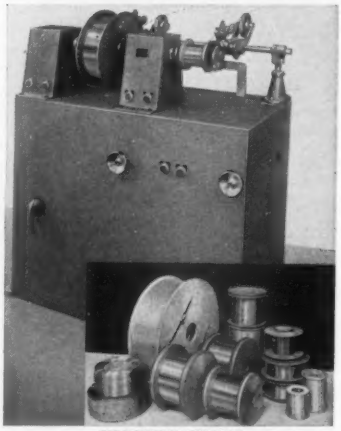
The New Model 1900-HVE Multi-Spindle SPOOLER, engineered to include the revolutionary U.S. Varidyne Power System, assures increased production, complete flexibility of adjustment, uniform wire tension and extremely close winding.

Each strand of wire lays parallel, with no overwinding or underwinding—and no tight or loose spaces. Each spindle is powered with a variable-speed AC motor, each of which can be stopped or started independently of the master power unit.

The 1900-HVE Spooler is a rigid, precision machine that will produce a uniform dense lay of wire consistently. It is completely adaptable to constant or changing demands. Adjustments can be made accurately with the spooler in operation and without tools. All controls are positive.

Your special requirements can be incorporated in the design.

***You are invited to consult us on your wire spooling problems. Our engineering resources and 60 years of experience are at your service.***



SPECIFICATIONS

Size Range: .010" to .080" or heavier if soft, and many flat wire sizes. Max. Spool Size: 16" flange diam. Capacity: Usually 4 to 10 spindles.

**ROBERT J. EMORY COMPANY**

31 East Runyon Street Newark 5, N. J.


during operation.

★ ★ ★

**Temperature** control of this furnace is the proportioning type with a 10 to 1 turndown ratio, and will be controlled in both zones by thermocouples in the heater tube area.

★ ★ ★

**Check** of steel temperature at the bottom outlet of the furnace can be accomplished by optical pyrometer.

★ ★ ★

**The** bottom sinker roll for the lead quench furnace is removable and geared, allowing the furnace to be strung cold, with facilities for immersing the sinker roll in the lead quench for quenching operation. The atmosphere gas chamber between the lead quench and the patenting furnace is also movable by gears for easy accessibility to the sinker roll.

★ ★ ★

**The** lead quench furnace has two zones of temperature control, with the entrance zone capable of using the heater tubes for either heating or cooling.

★ ★ ★

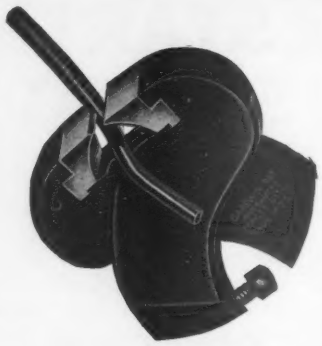
**Also** incorporated within the lead pan are additional tubes, at the entrance end, for air cooling the lead during patenting operation. It is also possible to use a lead pump in this entrance area if it is desirable to eliminate the cooling tubes.

★ ★ ★

**The** versatility of the furnace unit allows for its use as a patenting, normalizing or lead strand annealing furnace. Both of these units are fired with the dual pressure nozzle mix type burners with full proportioning control for the ultimate sensitivity of temperature control.

★ ★ ★

**The** application of radiant heating to galvanizing and lead pan furnaces is a natural result of the desire to avoid rapid oxidation and weakening of the pans. This application will also minimize dross formation in the galvanizing pans. Actually the radiant heating ap-



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**CUTTING NIPPER**

FEATURING—

- **Replaceable tool steel jaws. Hardened all the way through—not just carburized.**
- **Box joint construction.**
- **Forged handles of high tensile steel.**

We represent these to be the best wire cutting tools made anywhere.

***Ask your mill supply dealer for them!***

Made by

**M. W. ROBINSON CO., Inc.**

ROCKFALL
CONNECTICUT


plication is so efficient the furnace chambers are considerably cooler than they would be for direct firing, consequently the overall size of the setting is reduced.

★ ★ ★

This is also true for the controlled atmosphere patenting furnace. This type of equipment is a new tool for the wire industry, to make these heating operations more of a service than an art, with lower fuel costs, more uniform coatings applied, and better products for the wire mills' customers.

## Rod Packaging

(*Continued from page* 880)

In the actual stocking plan, recognition has been given to activity of the various grades. The active part of the stock, as much as possible is in a direct line. Rail car—stock pile—cleaning line. The reserve parts of common grades are placed in more remote areas.

★ ★ ★

As a result of this packaging effort, very definite savings have been derived from:

1. Substantial gains in floor loadings—reduced capital expenditures.
2. Reduction in handling costs—package is easier to handle. More weight can be handled at one time (double in our case). Travel distance is reduced by increased floor load.
3. Annealing furnace loads have been materially increased by loading compact bundles.
4. Reduction of steel mixtures.
5. The compacting process breaks off loose scale.
6. Two bands only to cut at cleaning line, instead of twenty.

In addition to the above, the following becomes possible.

7. Tests have indicated that we can handle these bundles horizontally with magnetic cranes. In some cases this will prove beneficial.
8. Where atmospheric conditions permit, rods can be stored outside by lift truck owing to the ease of handling and straight piling.

★ ★ ★

In conclusion let me say the plan is flexible and is open for improvement at all times without requiring costly structural changes.


for **extra tonnage**

**from your bar stock and wire dies**

coat with

**BORAX 5 MOL.**

**Borax and Borax 5 Mol Offer Many Advantages as a Coating Material**

Here is dust-free, granular material that is readily soluble in water and dries quickly. The residual film is tight yet pliable... won't flake off! Borax is safe to use, easy to handle, and non-irritating to the skin. You can feed stock faster and you get longer, more accurate performance from your dies.

***Check these advantages of borax-coated stock:***

- **COMPATIBLE WITH DRAWING LUBRICANT**
- **BETTER WORKING CONDITIONS**
- **FASTER BUTT WELDING**
- **LONGER DIE LIFE**
- **LONGER STORAGE WITH SAFETY**
- **CLEANER TO HANDLE IN TRANSIT**

*Write to our Technical Department for further information*

United States
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Corporation

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GATE TENSION ROLLERS
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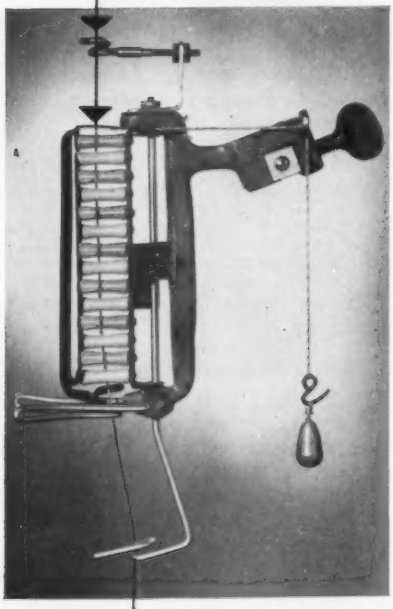
WITHSTANDS HI-SPEED PRESSURE OF SYNTHETIC YARNS AND WIRE BY THE TONS



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HEANY INDUSTRIAL CERAMIC CORP.
NEW HAVEN 3, CONNECTICUT

## The Merits of Large Coils

(*Continued from page* 870)

We confined all our purchase to that account on sixteen gage wire. The only wire which we bought was thirteen gage wire which we didn't necessarily have on the tower coil. At first it was off of sixteen inch block and later made available twenty-two inch block and all pay-off twenty-two inch block from thirteen gage, sixteen, eighteen, and eighteen and a half and some nineteen gage.

★ ★ ★

Now, all of the suppliers furnished us with these pay-off coils. Now, what were the results? What happened when we changed over from catch-weight coils to the present pay-off coil or lard coil? In the first place, our unloading time takes only one man and he unloads a carload or truckload, a truck and trailer and will take about forty minutes and it used to take about two hours with the two men and now one man does it. In the second place it stores in about thirty to fifty per cent of the space that was used for catch-weight coils. In fact, in one of the pictures that I will show you it will show that we can store six times as much wire in the same space with these as we did with catch-weight coil. There was a forty per cent saving in time from bringing these packs over from our warehouse to the machine. There was no dirt, no dust, and there was no oil or water getting on them. As a result, we get perfect welding which we didn't have before. The most important thing is that our down time was practically eliminated. Today where we are completely standardized on the tower coil or pay-off coil we make from one to five stops in a shift and these stops are not the long stops that we had before when it would be necessary to untangle the wire. These stops are very short and right back in business again.

★ ★ ★

Our production immediately went up and went up over the rated capacity of our machines. We are now producing from one thousand to eleven hundred and fifty

START SAVING in your Die Finishing Rooms

Double your Refinished Tungsten Carbide Die Production

CUT labor costs ½ with the New type "M" automatic

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The Standard of the Wire Industry

units per shift against six hundred units we produced prior to that time. We used to have two men on each machine and because of putting on the tower coils and a few other modifications—we made up an automatic paper feed on the machines which now reduced the number of men on that machine from two men down to one man so increasing from six hundred to about a thousand or eleven hundred units and this all brought our cost down considerably so we were able to compete with the metal lathe association or people that have raised their price in the last two years and now as they have raised their price we have maintained our price so now we are very competitive with the metal lathe association.

★ ★ ★

We are now shipping through the Panama Canal to Washington, D. C., four carloads to Florida last month and shipping to Houston, Texas, Chicago, Dallas, and Salt Lake City. We could not be competitive before but today we can go in there and be competitive. So, you can see this has done a great deal for the K-Lath Corporation and we highly recommend it for anybody who has automatic machines or machines like ours.

## Some Problems of the Manufacturers of Low Carbon Steel Wire Products

(*Continued from page 872*)

it costs 75 cents extra, and whether or not we gain anything by buying Extra Brite Wire in gages smaller than Number 9.

★ ★ ★

If you would like to talk about rotary welders I have some items here that we produce on this type machine, but it is a highly specialized device useful for only this one product.

Our Advertisers are Reliable.

Patronize Them.


**To Save Set-Up Time, Use The CRUM CALCULATOR**

FOR WIRE DRAFTING

Provides quick and accurate information on die sizes. Calculates production rates for various speeds.

Readings in B&S gages • Fits in pocket • Made of plastic.

PRICE: $5.00 EACH. ORDER FROM

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Dual Takeup Stands, N.E.B. Upright Twisters, Sinfra Knitters, 30" Takeups, Serving Equipment, Stranders, and many other types of wire and cable equipment.

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WICKWIRE BROTHERS, INC. CORTLAND, N.Y.

**UP** GOES METAL-CUTTING OUTPUT

**DOWN** GO LABOR COSTS!

— WHEN YOU USE THE **NEW**

**PORTER WORK-STATION CUTTER**

**For PRODUCTIVE CUTTING of HARD BOLTS, SPRING WIRE, RODS, CHAIN, BARS, WIRE ROPE and CABLE.**

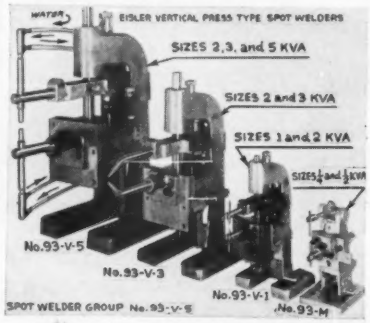
If the job is lagging — and costs are getting out of line — on your metal-cutting work, invest in low-cost PORTER WORK-STATION CUTTERS. They are increasing the output per man up to 300% for many users. Fastens securely to bench or work station for permanent installation — or can be carried easily to any job location. Available in 3 Sizes with up to nine types of cutter-heads for an unlimited variety of work. Hand operated, with easy, powerful one-hand action, leaving other hand free for continuous feeding. Capacities up to ½" diameter and 2½" width (flat bars and strip steel). *Ask your Industrial Supplier for a demonstration — or write for literature.*

**H. K. PORTER, INC.** SOMERVILLE 43, MASS.

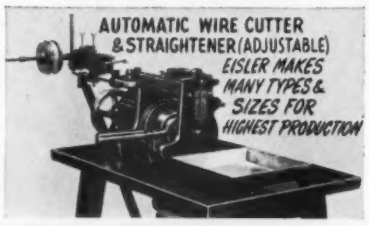


**Eisler Makes The Largest Selection of Small Spot, Wire, Butt, Seam and Foil Welders. Send for Cat. #93-57**

**A WELDER FOR EVERY PURPOSE**




**Wire Cutting-Straightening and Forming Machines for All Types of Wire**




**EISLER ENGINEERING CO., INC.**

CHARLES EISLER, Jr., Pres.

747 South 13th St. Newark 3, N. J.


## The Regional Meeting In Los Angeles

(*Continued from page* 868)

Pacific Wire Rope Co.
Peanuts Steak House
Quality Maid Spring Co.
Rapid Wire Products
John A. Roebling's Sons Corp.
Southwest Steel Rolling Mill
Stauffer Chemical Co.
Topper Manufacturing Co., (Fortner & Perrin Co.)
U. S. Borax & Chemical Corp.
Vaughn Machinery Co.
Western Insulated Wire Corp.
Wheelabrator Corp.
Wilshire Manufacturing Company
G. F. Wright Steel & Wire Co.
Z. Zoraster

### The Program Committee

No meeting can be successful or function smoothly without some preliminary hard work on the part of a number of persons who, so to speak, have functioned "behind the scenes."

★ ★ ★

The men who so gave their time to make the 1958 West Coast Regional Meeting outstandingly good were:

Joseph F. Conlan (Chairman)
Pres., City Wire and Iron Works, Inc.
Los Angeles, Calif.

Elmer E. Bonds, Supt.
K. H. Davis Wire & Cable Corp.
Los Angeles, Calif.

Bud Coffin, Wire Sales
Columbia-Geneva Steel Div.
United States Steel Corp.
Los Angeles, Calif.

Harold B. Hansen, So. Cal. Sales Mgr.
Colorado Fuel & Iron Corp.
Los Angeles, Calif.

James Nixon
Colorado Fuel & Iron Corp.
Los Angeles, Calif.

Earl R. Potter, Pres.
Industrial Wire Products Corp.
Los Angeles, Calif.

Peter J. Siemonsma, Asst. Treas.
Planett Manufacturing Co.
Downey, Calif.

Clyde Wilson, Wire Sales
Bethlehem Pacific Coast Steel Corp.
Los Angeles, Calif.

★ ★ ★

We are grateful to these gentlemen for their dedicated efforts and congratulate them on the fine outcome of their planning. The Pacific Coast states are developing rapidly


**ENGINEERED YARNS**

**FOR WIRE INSULATION**

**SYNTHETIC THREAD'S TECHNICAL SERVICE,**

with its long experience and knowledge of the Insulated Wire business, is available to help you select the BEST YARNS at the BEST PRICES for your special needs.

**SYNTHETIC YARNS**

OF

FORTISAN • NYLON • DACRON • ACETATE • ORLON • VISCOSE RAYON • LONG FIBRE COTTON and OTHERS are supplied in a variety of packages — STANDARD or SPECIAL—for Braiding, Serving, Identification and other uses.

All yarns prepared to meet Government or YOUR Special Specifications. Samples, prices and data sent upon request.

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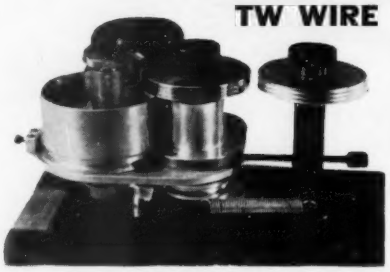
**PHOTO-ENGRAVED MARKING WHEELS**

**"3 IN 1"**

**3 Wheels for price of 1 wheel**

**TW WIRE**



TYPE SM MARKER

1. No "Down-time" because of wheel change. Change type by only re-positioning wire.
2. Proper size guide wheel eliminates operator error in using wrong type.
3. Wheels made of Rockwell 66 hard tool steel, industrial hard chrome plated.

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as a major industrial area and paralleling this growth these West Coast Regional Meetings of our Association become more important each year. This year's meeting was no exception to the trend.

★ ★ ★

It was heartening, too, to note that more wire men from the Midwest and East made the long trek to California than ever before, including, among others, the Association's president, **Tom M. Girdler, Jr.**, Executive Secretary, **Richard E. Brown**, Assistant Executive Secretary, **Mrs. R. S. Spengel**, and **J. Edward Donnellan** of Wire and Wire Products.

★ ★ ★

From all accounts, it was evident that those who took in the meeting felt well-rewarded.

Have You Read
"STEEL WIRE IN AMERICA"?
by Kenneth B. Lewis
The price is $15.00

## Conductor Economics

(*Continued from page 874*)

extrapolated to this higher range, and, therefore, a tremendous amount of research is being conducted by the cable industry to determine the solution to this high voltage problem. This research program will be culminated by a cooperative testing program by utilities and cable manufacturers at Cornell University. Without this research program the utility industry would be forced into uneconomical solutions of tomorrow's problems with today's cables. The urgency and long term economic benefits of such a research program are therefore obvious.

★ ★ ★

I hope that this afternoon we have been able to provide an insight into some of the problems facing our industry. I should like to conclude with a brief definition of the word "Economic." "Economics" is the prudent planning of the disposition of resources to avoid unnecessary waste and to

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Reliable delivery schedules at a fair price.
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**MUSIC WIRE and SPECIAL WIRES**

Music Wire for Industrial Purposes
211 sizes Bright Polished, .0015" to .3437"
45 sizes Bright Tinned, .003" to .125"
Aluminum—Annealed—Belt Lacing—Brass, Soft and Spring—Copper, Bare and Tinned
Coppered Steel Spring—Galvanized—Tinned
Monel—Nickel Silver—Pure Soft Nickel—Oil Tempered, Steel Spring, Black Finish
Phosphor Bronze, Spring Temper—Pure Iron Wire—Resistance Wire,
Hoskins Chromel "A"—Stainless, Soft and Spring Temper—Tag Wire, 1000
in an Envelope—Florist Wire—Spooled and Coiled, ¼-½-1-5#
Wires Straightened and Cut to length—Small Gauges—Small orders our specialty
Wires and Strands for the fishermen. Trolling Wires, Copper-Monel-Stainless.
Leader Wires, "Wilstabrite" Stainless and "Silverbrite" Music.
Dental and Surgical Wires, large assortment.

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**STRONG METAL BOUND RETURNABLE REELS**

FAST DEPENDABLE SERVICE ON QUALITY REELS, 12" TO 30" DIAM.

Built to take a beating! Built to protect Coated or Insulated Wire from damage! Kiln dried stock — No nails — Bolted, Waterproof, Glued construction.
Especially designed to prevent breaking or splintering.

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effect savings. I might add to that, savings to the ultimate consumer of electrical wires and cable products.

## Thermalex-F

(*Continued from page* 876)

**Results show that Thermalex-F can be used in the following:**

1. **Stator wound motors of all sized Class F layer wound coils.**
2. **Class F random wound coils.**
3. **DC motor field coils.**
4. **Random and layer wound coils that will operate in excess of Class F 155 degrees C for short duration of time (see AIEE Nbr 57 Thermal Stability Chart).**

★ ★ ★

**Thermalex-F** should not be used in hermetically sealed units where moisture is present due to the hydrolization of the Thermalex-F, although these newer modified polyesters are much superior to the original Class B polyester in this respect.

★ ★ ★

**One** of the paramount aspects of Thermalex-F is the ability of producing Thermalex-F in the size range AWG 8 to AWG 50 and most sizes of square and rectangular wires.

## New Sealing Washer Developed

A revolutionary new type of washer, partially dome shaped, with a measured amount of sealing compound adhered to the underside, is now being made and marketed by the **L. J. Barwood Manufacturing Co., Inc.**

★ ★ ★

**The** Bartite® Sealing Washer (patents pending — U.S.A., Can., Gr. Brit.) is now available in mild steel and high-carbon steel, heat treated, stainless steel, and other metals. When pressure is applied the dome of the Bartite Washer compresses, forcing the PVC sealant to flow downward to seal the space between the clearance hole and fastener threads; outward to seal the space between the contoured underside of the washer and the surface of the fastened material; upward to seal the space between the fastener head and

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washer hole. Thus, a complete sealing is accomplished.

★ ★ ★

**Further** information is available from the L. J. Barwood Manufacturing Co., Inc., 28 Williams St., Everett 49, Mass.

## Aluminum Used in Fire Alarm System

A multi-conductor cable recently installed in Newark, N. J., is believed to be the first aluminum conductor used in an underground fire alarm system.

★ ★ ★

**The** 15 conductor **Kaiser Aluminum** cable, size 12 AWG, Laytex insulated and neoprene jacketed, was pulled in a continuous length through a duct line in the heart of Newark's business district for a distance of 700 feet between two main intersections.

★ ★ ★

**The** aluminum cable is approximately 60 percent of the weight and 15 percent less costly than an equivalent copper cable. The cable was pulled manually for 65 feet through ducts from each manhole to the fire alarm pedestals. Connections were made with standard terminal blocks mounted within the pedestals. The brass studs were cadmium plated and the washers and nuts were nickel plated to accommodate the aluminum conductor. The solid conductor with the insulation removed at the end was formed into a loop before making connection, abraded with a glass fiber brush and treated with Penetrox to prevent the surface of the metal from oxidizing.

## Reservation System Uses 50,000 Miles of Copper Conductors

A new $16,000,000 airlines reservation system, the largest industrial application to date of interconnected electronic data processing equipment, will require about 50,000 miles of copper conductor, according to its manufacturer, Teleregister Corporation.

★ ★ ★

**The** system has been ordered by **United Air Lines** to connect 80 cities on its 14,000 mile routes.

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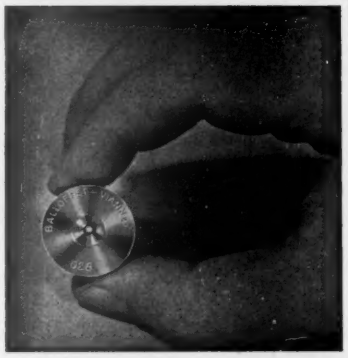

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## Chase Brass Adds Aluminum Specialist

**Appointment** of **Ralph E. Herzler, Jr.**, of Naperville, Ill., as aluminum specialist for **Chase Brass & Copper Co.**, a subsidiary of **Kennecott Copper Corporation**, was announced today by **W. E. Evans**, general sales manager for the brass concern. Mr. Herzler comes to Chase after 18 years in the aluminum business and will make his headquarters in the Chicago office of Chase for the immediate present.

★ ★ ★

His initial assignment will be to initiate the overall Chase aluminum program in the Chicago area, and to assist other mid-western districts in the development of their rerolling plans. Earlier this year, Chase announced its association with Kaiser Aluminum for selling certain aluminum products and for rerolling aluminum sheet in its brass mills.

★ ★ ★

**Mr. Herzler** has an impressive background in the aluminum business, having been associated with **Aluminum Company of America** from 1940 to 1945, following his graduation from the University of Illinois where he received a B.S. degree, with honors, in Metallurgical Engineering. He joined the **Reynolds Metals Co.** in 1946, first as supervisor of a manufacturing department and for the past 11 years in sales. His most recent position there was that of regional sales manager for the industrial parts division.

## Appointed Assistant Manager Lubricant Development

**Appointment** of **Kenneth B. Wood, Jr.** as Assistant Manager of Lubricant Development was announced today by **Reuel E. Warriner**, Vice President-Sales, of **Climax Molybdenum Company**, a Division of **American Metal Climax, Inc.** His responsibilities will be to develop new applications and markets for molybdenum disulphide lubricants.

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Mr. Wood brings with him many years of experience in the oil industry, beginning as a trainee with The Texas Co.'s Foreign Sales Dept. Early in 1951, he was recalled to active duty with the Navy for a two year period. He served with the Bureau of Aeronautics, Fuels and Lubricants Branch in Washington, D. C., and then with the Armed Services Petroleum Purchasing Agency also in Washington, D. C., and finally, as Navy Representative to Area Petroleum Offices in Europe and the Middle East. Upon his release from active duty he joined the Cities Service Oil Co. as an Industrial Sales Engineer. For the past three years he has been Manager of Lubricant Sales for the New York Region.

★ ★ ★

Mr. Wood. a resident of Mt. Kisco, New York, is a graduate of the University of Virginia and a member of A.S.L.E. He was a Naval Aviator during World War II and is a former Lieutenant Commander in the Naval Reserve.

## Poor & Co. Appoints Sales Manager

**William Stark**, Vice President of **Poor & Company** announces the appointment of **Louis R. Callas** as Sales Manager, Promat Division of Poor & Company in Waukegan, Illinois. Mr. Gallas' wide experience in the metal finishing field will complement the expanded effort of Promat Division of Poor & Company to make available its many products and processes to an even greater number of users. Mr. Gallas will be intrumental in establishing the enlarged distribution program which will make available even better service and a wider range of products so vital to the metal finishing industry.

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# Index to Advertisers


A

Acrometal Products, Inc. ..... 869
Ajax Electric Company ..... 933
Ajax Industrial Supplies, Inc. ..... 932
Aluminum Company of America ..... 863
Amchem Products, Inc. ..... 856-B
American Chain & Cable, Page Steel & Wire Division ..... 832
American Insulating Machinery Company ..... 851
American Lanolin Corp. ..... 930
American Laubscher Corporation ..... 831
American Pulley Company, The, Hubbard Spool Division ..... 915
American Woodworking Company ..... 933
Apco Mossberg Company ..... 897
Armco Steel Corporation, Sheffield Division ..... 838

B

Balloffet-Vianney Wire Die Co., Inc. ..... 931
Behr Machinery & Equipment Corp. ..... 929
Bethlehem Steel Company ..... 826
Blane Corporation, The ..... 833
Boonton Molding Co. ..... 919
Boulin, Victor J., Inc. ..... 932
Brenon, Inc. ..... 932
Bridge Manufacturing Company ..... 847

C

Carl Mayer Corp., The ..... 921
Carpenter Steel Co., Webb Wire Div., The ..... 933
Cary Chemicals Inc. ..... 901
Chemical Products Corporation ..... 896
Cleveland Tramrail Division of
The Cleveland Crane & Engineering Co. ..... 830
Colbourne Machine Co. ..... 932, 933, 934
Collins Bros. Machine Co. ..... 933
Continental Can Company ..... 840
Continental Steel Corporation ..... 894
Cook Manufacturing Co. ..... 840-B
Coulter & McKenzie Machine Co., Inc., The ..... 864

D

Danforth Company, C. W. ..... 921
Davis Electric Company ..... 933
Davis-Standard Division of Franklin Research Corporation ..... 827
DuPont de Nemours & Co., (Inc.), E. I.-Film Dept. ..... 837
Durkee Manufacturing Co. ..... 933
Dykrex Corporation of America ..... 926

E

Eastern Carbide Corporation ..... 931
Edmands Co., The ..... 920
Eisler Engineering Co., Inc. ..... 928
Electric Furnace Co., The ..... Back Cover
Elgin National Watch Company, Abrasives Division ..... 881
Emory Company, Robert J. ..... 924
Entwistle Co., James L. ..... 902
Entwistle Manufacturing Corporation ..... 848
Evans Corporation, The George ..... 843

F

Federal Manufacturing Co., The ..... 933
Firth Sterling, Inc. ..... 846
Fisher Associates ..... 933
Fort Wayne Diamond Products, Inc. ..... 932
Fort Wayne Wire Die, Inc. ..... 932

G

Gem Gravure Co., Inc. ..... 928
Gillies Co., Inc. Duncan M. ..... 893
Glader Machine Works, Wm. ..... 903

H

Hanson & Edwards, Ltd. ..... 916
Haskell-Dawes Machine Co., Inc. ..... 922
Heany Industrial Ceramic Corp. ..... 926
Herborn Maschinenfabrik ..... 835
Hodge Bros. Machine Shop ..... 933
Hoosier Wire Die Inc. ..... 932
Hubbard Spool Division, The American Pulley Company ..... 915

I

Indiana Wire Die Company ..... 932
Industrial Winding Machinery Corp. ..... 933

J

Jarke Manufacturing Company ..... 920
Jones & Laughlin Steel Corporation ..... 844

K

Kelly Wire Die Corporation ..... 932
Keystone Steel & Wire Company ..... 840-A
Kraft, J. A., Maschinenfabrik ..... 917

L

Larmuth (1947) Ltd. ..... 922
Lewis Machine Company, The ..... 918

M

Malin & Company, The ..... 930
McCaskie, Inc., Wm. ..... 930
Metal Carbides Corporation ..... 834
Mettler Machine Tool, Inc. ..... 842
Michigan Oven Company ..... 836
Micro Products Co. ..... 852
Miller Company, Inc., R. H. ..... 866
Molded Fiber Glass Tray Co. ..... 933
Monsanto Chemical Company ..... 872-A, B, C and D
Montgomery Company, The ..... 930
Morgan Construction Company ..... Front Cover
Morgardshammars Mek Verkstads AB ..... 845
Mossberg Pressed Steel Corporation, Div. of Wanskuck Co. ..... 904

N

National Electric Welding Machines Co. ..... 849
National Lock Washer Company, The ..... 861
National Machinery Exchange ..... 933
National Research Company ..... 931
National Vulcanized Fibre Co., Lestershire Spool Division ..... 899
National Wire Die Co., Inc. ..... 932
Naugatuck Chemical Div., United States Rubber Company ..... 859
New England Butt Co., Div. of Wanskuck Co. ..... 929
New England Wire Die Co. ..... 932
Nichols Wire & Aluminum Co. ..... 853
Niederrheinische Huette A. G., Kurt Orban Company, Inc. ..... 929
Nopco Chemical Company ..... 923
Northern Indiana Steel Supplies Co., Inc. ..... 856
Norton Company ..... 906

O

Ofenbau, Fritz G m b H ..... 905
Orban Company, Inc., Kurt, Niederrheinische Huette A. G. ..... 929

P

Pacific Coast Borax Company, Division of
United States Borax & Chemical Corporation ..... 925
Page Steel & Wire Division, American Chain & Cable ..... 832
Parkin Chemical Co., The ..... 933
Pittsburgh Carbide Die Co. ..... 932
Platt Bros. & Co., The ..... 933
Porter, Inc., H. K. ..... 928
Pourtier Pere et Fils ..... 907

R

Reicher, Paul—H. A. Schlatter, Ltd. ..... 860
Republic Steel Corporation ..... 829
Robinson Co., Inc., M. W. ..... 925
Roebling's Sons Corporation, John A. ..... 856-A
Rommel, Allwine & Rommel ..... 934
Royle & Sons, John ..... 912
Rusch Wire Die Corporation ..... 932

S

Schlatter, Ltd., H. A.—Paul Reicher ..... 860
Scott Testers, Inc. ..... 933
Scovill Manufacturing Company ..... 841
Scudder Foundry & Machine Co., E. J. ..... 932
Sheffield Division, Armco Steel Corporation ..... 838
Sjogren Tool & Machine Co., Inc. ..... 913
Stamford Processing Co. ..... 933
Standard Industrial Compounds Co., Inc. ..... 825
Standard Mill Supply Company ..... 908
Strand Buffalo Corp. ..... 932
Sunbeam Corporation, Industrial Furnace Division ..... 862
Superior Tool & Manufacturing Co. ..... 927
Swift & Company ..... 857
Syncro Machine Company ..... 828
Synthetic Thread Corp. ..... 928

T

Thompson Chemical Company ..... 839
Torrington Manufacturing Company, The ..... 898
Twitchell, Inc., E. W. ..... 895

U

United States Borax & Chemical Corporation
Pacific Coast Borax Company Division ..... 925
U. S. Industrial Chemicals Co., Division of
National Distillers & Chemical Corp. ..... 854
United States Rubber Company, Naugatuck Chemical Div. ..... 859
Universal Industrial Equipment Co. ..... 910
Universal Wire Die Co. ..... 932

V

Vaughn Machinery Company, The ..... 855

W

Wardwell Braiding Machine Co. ..... 900
Warner Company ..... 929
Wartenweiler, Emilio ..... 911
Waterbury-Farrel Foundry & Machine Co., The ..... 875
Watson Machine Company, The ..... Inside Back Cover
Wayne Wire Die Co. ..... 931
Webb Wire Div., Carpenter Steel Co., The ..... 933
Wells Company, Frank L. ..... 909
Western Wire & Textile Machinery, Inc. ..... 924
Whitacre Engineering & Manufacturing Company ..... 914
Wickwire Bros., Inc. ..... 927
Wilson, Lee, Engineering Company, Inc. ..... Inside Front Cover
Wire Insulating Machinery, Inc., Division of
Machinery Electrification, Inc. ..... 907
Wire & Textile Machinery, Inc. ..... 927
Wire Tool Division, Bridgeport Jig Boring Company ..... 923

Y

Youngstown Sheet & Tube Company, The ..... 858

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Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

### CASTINGS—Wire Mill
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.

### CEMENTS—Refractory
Norton Co., Worcester, Mass.

### CLEANERS—Metal
Amchem Products, Inc., Ambler, Pa.
Apex Alkali Products Co., Phila., Pa.
Magnuson Products Corporation, Brooklyn, N.Y.
Miller, R. H., Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Parkin Chemical Co., The, Pittsburgh, Pa.
Standard Industrial Compounds Co., Frankfort, Ill.

### CLEANING & PICKLING EQUIP.—
Cleveland Tramrail Div., of the Cleveland Crane & Engineering Co., Wickliffe, Ohio
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

### CLOTH—WIRE, All Metals
Wickwire Bros., Cortland, N. Y.

### COATING COMPOUNDS—
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N.Y.
Miller, R. H., Co., Homer, N. Y.
Standard Industrial Compounds Co., Frankfort, Ill.
United States Borax & Chemical Corp., Div. Pacific Coast Borax Co., New York, N. Y.

### COLOR CONCENTRATES— For Wire Coatings
Blane Corporation, The, Canton, Mass.

### COMPOUNDS—Coppering
Amchem Products, Inc., Ambler, Pa.
Miller, R. H. Co., Inc., Homer, N. Y.

### COMPOUNDS—Diamond (Pre-Mixed)
Eastern Carbide Corp., New Rochelle, N. Y.
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hyprez Div., Engis Equipment Co., Chicago
Rusch Wire Die Corporation, Croton-on-Hudson, N. Y.

### COMPOUNDS—Extrusion, for Wire
Blane Corporation, The, Canton, Mass.
Cary Chemicals, Inc., New Brunswick, N. J.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.

### COMPOUNDS—For Improving Drawing & Extrusion
Amchem Products, Inc., Ambler, Pa.

### COMPOUNDS—Metal Finishing
Amchem Products, Inc., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

### COMPOUNDS—Phosphate Coating
Amchem Products, Inc., Ambler, Pa.

### COMPOUNDS—Rust Preventing
Amchem Products, Inc., Ambler, Pa.
American Lanolin Corporation, Lawrence, Mass.
Apex Alkali Products Co., Philadelphia, Pa.

### COMPOUNDS—Rust Removing
Amchem Products, Inc., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N.Y.
Nopco Chemical Co., Harrison, N. J.
Standard Industrial Compounds Co., Frankfort, Ill.

### COMPOUNDS—Vinyl
Blane Corporation, The, Canton, Mass.
Chemical Products Corporation, East Providence, R. I.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.

### COMPOUNDS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N.Y.
Miller, R. H. Co., Inc., Homer, N. Y.
Nopco Chemical Co., Harrison, N. J.
Standard Industrial Compounds Co., Frankfort, Ill.
Swift & Company, Chicago, Ill.
United States Borax & Chemical Corp., Pacific Coast Borax Co. Div., New York, N. Y.

### CONDUCTORS—Flexible, Electrical
Montgomery Co., The, Windsor Locks, Conn.

### CONTAINERS—Wire Packaging
(See DRUMS—Wire Packaging)

### COPHOLDERS—Steel
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Wire & Textile Mach'y, Inc. (used) Pawtucket. R. I.

### CORDS—Electrical, Tinsel Conductor
Montgomery Co., The, Windsor Locks, Conn.

### COUNTERS—
(See MACHINERY—Measuring Wire and Cable)

### CRANES—Wire Mill
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

### CUTTING TOOLS—Carbide
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Metal Carbides Corporation, Youngstown, Ohio
Metallurgical Products Dept. of General Electric Co., Detroit

### CUTTING TOOLS—Wire
Porter, H. K., Inc., Somerville, Mass.
Robinson, M. W. Co., Rockfall, Conn.

### DIAMONDS—Industrial
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

### DIAMOND POWDERS—
Danforth, The C. W. Co., Youngstown, Ohio
Elgin National Watch Co., Abrasives Div., Elgin, Ill.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Hyprez Div., Engis Equipment Co., Chicago, Ill.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
National Research Company, St. Clair Shores, Mich.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.

### DIAMOND POWDER RECLAIMING—
Danforth, The C. W. Co., Youngstown, Ohio
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
National Research Co., St. Clair Shores, Mich.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

### DIAMOND TOOLS—
Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.

### DIES—Carbide, Tungsten & Tantalum
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Metallurgical Products Dept. of General Electric Co., Detroit
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.

### DIES—Cold Heading
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio
Metallurgical Products Dept. of General Electric Co., Detroit

### DIES—Diamond
Ajax Industrial Supplies, Inc., Ft. Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Brenon, Inc., Nixon, N. J.
Ft. Wayne Wire Die Inc., Fort Wayne, Ind.
Hoosier Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
National Wire Die Co., Inc., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.

### DIES DIAMOND—Drawing Angle Controlled
Hoosier Wire Die, Inc., Ft. Wayne, Ind.

### DIES DIAMOND—Reversible
National Wire Die Co., Inc., New York, N. Y.

### DIES—Extrusion
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Kelloy Corporation, New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio
Metallurgical Products Dept. of General Electric Co., Detroit
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.
Wire Tool Div., Bridgeport Jig Boring Co., Bridgeport, Conn.

### DIES—Eyelet
Eastern Carbide Corp., New Rochelle, N. Y.
Kelloy Corporation, New York, N. Y.

### DIES—Nail, Nail Cutters, Feeder Blocks, Grippers, etc.
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

### DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

### DIES—Polishing, Asbestos Wire
Beard Machine Co., York, Pa.

### DIES—Repairs & Re-Cutting
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., Inc., New York, N. Y.
Brenon, Inc., Nixon, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Hoosier Wire Die, Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio
Metallurgical Products Dept. of General Electric Co., Detroit
National Wire Die Co., Inc., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.
Universal Wire Die Co., Hillside, N. J.
Wayne Wire Die Co., Hillside, N. J.

# WHERE TO BUY, Continued

For more complete information, consult the annual Wire and Wire Products Buyers' Guide.

**DIES—Special Shapes, Etc.**
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelloy Corporation, New York, N. Y.

**DIES—Swaging**
Sjogren Tool and Mach. Co., Inc., Auburn, Mass.

**DIES—Tube Drawing**
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth Sterling, Inc., Pittsburgh, Pa.
Hoosier Wire Die., Inc., Ft. Wayne, Ind.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelloy Corporation, New York, N. Y.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Metallurgical Products Dept. of General Electric Co., Detroit
Rusch Wire Die Corp., Croton-on-Hudson, N. Y.

**DRAW BENCHES—**
(See MACHINERY—Draw Benches)

**DRIVES—Electric, Adjustable Speed**
Allis, The Louis Co., Milwaukee, Wisc.

**DRUMS—Wire Packaging**
Continental Can Company, Van Wert, Ohio
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

**DRUMS & TRAVERSES—For Cable Reels**
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio

**DRYING EQUIPMENT—**
Carl Mayer Corp., The, Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.

**EYELETS—Brass or Zinc**
Platt Bros. & Co., The, Waterbury, Conn.

**FOAM PRODUCING COMPOUNDS—**
Amchem Products, Inc., Ambler, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

**FREQUENCY CHANGERS—**
The Louis Allis Company, Milwaukee, Wisc.

**FURNACES—Brazing**
Ajax Electric Company, Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.

**FURNACES—Galvanizing Equipment**
Electric Furnace Co., Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.
Wilson, Lee, Engr. Co., Cleveland, Ohio

**FURNACES—Heat Treating**
Ajax Electric Company, Philadelphia, Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.
Wilson, Lee, Engr. Co., Cleveland, Ohio

**FURNACES—Pot (Oil, Gas, Electric)**
Ajax Electric Company, Philadelphia, Pa.
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.

**FURNACES—Resistance Heating, Strand**
Electric Furnace Company, Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.

**FURNACES—Salt Bath**
Ajax Electric Company, Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio

**FURNACES—Strand Annealing**
Ajax Electric Company, Philadelphia, Pa.
Electric Furnace Company, Salem, Ohio
Sunbeam Corporation, (Industrial Furnace Division), Chicago, Ill.

**GALVANIZING EQUIPMENT—(See MACHINERY—Galvanizing Wire)**

**GEARMOTORS—**
The Louis Allis Company, Milwaukee, Wisc.

**GRINDERS—Roll**
Norton Co., The, Worcester, Mass.

**GUIDES—For Wire**
Burlington Fabricators Inc., Products Div., Burlington, N. J.
Heany Industrial Ceramic Corp., New Haven, Conn.

**GUIDE TIPS—For Extruding Machines (See NOZZLES)**

**HAMMERS—Nail Heading**
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

**HAMMERS—Swaging**
Sjogren Tool and Machine Co., Auburn, Mass.

**HOISTS—Electric Travelling**
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio

**INHIBITORS—Pickling**
Amchem Products, Inc., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin Chemical Co., The, Pittsburgh, Pa.

**INKS—Printing, for Insulated Wire**
Chemical Products Corporation, East Providence, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company, West Hanover, Mass.

**INSULATING MATERIALS —**
Apex Tire & Rubber Co., Pawtucket, R. I.
Blane Corporation, The, Canton, Mass.
Cary Chemicals, Inc., New Brunswick, N. J.
duPont de Nemours Co., (Inc.), E. I., Polychemical Dept., Wilmington, Delaware
General Electric Company, Insulating Materials Section, Schenectady, N. Y.
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Shawinigan Resins Corporation, Springfield, Mass.
Thompson Chemical Company, Pawtucket, R. I.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, New York, N. Y.

**LACQUERING SYSTEMS—See MACH.—Lacquering Electric Wire**

**LAME—LAHN—**
Montgomery Co., The, Windsor Locks, Conn.

**LIME—**
Warner Co., The, Philadelphia and Bellefonte, Pa.

**LUBRICANTS—For Metal Cutting, Stamping and Drawing**
Apex Alkali Products Co., Philadelphia, Pa.
Magnuson Products Corporation, Brooklyn, N.Y.
Miller, R. H., Co., Inc., Homer, N. Y.
Nopco Chemical Company, Harrison, N. J.
Standard Industrial Compounds Co., Frankfort, Ill.

**LUBRICANTS—Wire Drawing**
(See Compounds—Wire Drawing)

**LUBRICANTS—Wire Rope**
Swift & Co., Chicago, Ill.

**MACHINERY—Armoring (Cable, Wire, Hose)**
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc., (used), Pawtucket, R. I.

**MACHINERY—Barbed Wire**
Glader Wm., Machine Works, Chicago, Ill.

**MACHINERY—Bobbin Winders**
Hanson & Edwards, Ltd., Warrington, England
Larmuth and Bulmer, Limited, Manchester, England

**MACHINERY—Bolt, Rivet, Screw, etc.**
Behr Machinery & Equipment Corp., Rockford, Ill.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

**MACHINERY—Braiding**
New England Butt Co., Providence, R. I., Division of Wanskuck Co.
Wardwell Braiding Machine Co., Central Falls, R. I.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Bunching**
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Hanson & Edwards, Ltd., Warrington, England
Haskell-Dawes Machine Co., Philadelphia, Pa.
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Bundling, Scrap**
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Cable, Electric**
American Insulating Mach'y Co., Phila., Pa.
Cook Mfg. Co., The, Paterson, N. J.
Haskell-Dawes Machine Co., Philadelphia, Pa.
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Capstans (See Capstans and Machinery—Winding Wire)**

**MACHINERY—Centerless Grinding & Polishing**
American Laubscher Corporation, New York, N. Y.

**MACHINERY—Chain Link Fence**
Norton & Co., Ltd., Sir James Farmer, Manchester, England

**MACHINERY—Chain Making**
Baird Machine Company, Stratford, Conn.
Larmuth and Bulmer, Limited, Manchester, England
Nilson, A. H. Machine Co., Shelton, Conn.

**MACHINERY—Closing Rope**
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
Larmuth and Bulmer, Limited, Manchester, England
Watson Machine Co., Paterson, N. J.

**MACHINERY—Coiling Rod**
Vaughn Mach'y Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

**MACHINERY—Cold Heading**
Behr Machinery & Equipment Corp., Rockford, Ill.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

**MACHINERY—Copper Wire Drawing**
American Insulating Mach'y Co., Phila., Pa.
Cook Mfg. Co., The, Paterson, N. J.
Herborn, Maschinenfabrik, Herborn, Germany
Morgardshammars Mek Verkstads A. B., Morgardshammar, Sweden.
National Mach'y Exch (Used), New York
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.
Whitacre Engineering & Manufacturing Company, Alhambra, California

**MACHINERY—Covering Wire (See MACHINERY—Insulating Wire)**

**MACHINERY—Cutting**
Eisler Engineering Company, Newark, N. J.
Lewis Machine Co., The, Cleveland, Ohio
Mettler Machine Tool, Inc., New Haven, Conn.

**MACHINERY—Dead Block (Stationary Coiler)**
Morgan Construction Company, Worcester, Mass.
Wells Company, Frank L., Kenosha, Wisc.
Whitacre Engineering & Manufacturing Company, Alhambra, California

**MACHINERY—Descaling Rod, Dry**
Fisher Associates, New York, N. Y.
Herborn, Maschinenfabrik, Herborn, Germany
Wheelabrator Corporation, Mishawaka, Indiana

**MACHINERY—Die Making**
Boulin, Victor J., Inc., New York, N. Y.
Dykrex Corp., Roos Tool & Mfg. Div., Newark, N. J.
Firth Sterling, Inc., Pittsburgh, Pa.
Metallurgical Products Dept. of General Electric Co., Detroit
Wayne Wire Die Co., Hillside, N. J.

**MACHINERY—Draw Benches**
Morgan Construction Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Edging (See MACHINERY — Tandem Rolling and Edging Mills)**

**MACHINERY—Enameling**
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Davis Electric Co., Wallingford, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.

**MACHINERY—Extruding**
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Royle, John, & Sons, Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Fence**
Glader, Wm., Machine Works, Chicago, Ill.
Norton & Co., Ltd., Sir James Farmer, Manchester, England

# WHERE TO BUY, Continued

**MACHINERY—Flat Wire**
Mettler Machine Tool, Inc., New Haven, Conn.
Torrington Mfg. Co., Torrington, Conn.

**MACHINERY—Forming Wire**
Baird Machine Company, Stratford, Conn.
Nilson, A. H. Machine Co., Shelton, Conn.

**MACHINERY—Galvanizing Wire**
Vaughn Machinery Co., Cuyahoga Falls, O.
Whitacre Engineering & Manufacturing Company, Alhambra, California
Wilson, Lee, Engr. Co., Cleveland, Ohio

**MACHINERY—Gang Winders**
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Mfg. Co., Wallingford, Conn.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Grinding**
Norton Co., The, Worcester, Mass.

**MACHINERY—Hydraulic**
Porter, Inc., H. K., Somerville, Mass.

**MACHINERY—Insulating Wire**
American Insulating Mach'y Co., Phila., Pa.
Beard Machine Co., York, Pa.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Pourtier Pere et Fils, Romainville (Seine), France
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Lacquering Electric Wire**
American Insulating Mach'y Co., Philadelphia
Cook Mfg. Co., The, Paterson, N. J.
Michigan Oven Company, Detroit, Mich.

**MACHINERY—Lock Washer**
Sleeper & Hartley, Inc., Worcester, Mass.

**MACHINERY—Material Handling**
(See Material Handling Equipment)

**MACHINERY—Measuring Wire & Cable**
Davis Electric Co., Wallingford, Conn.
Entwistle, James L., Esmond, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Nail and Tack**
Glader, Wm., Machine Works, Chicago, Ill.
National Mach'y Exch. (Used), New York, N. Y.

**MACHINERY—Packaging Wire**
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Whitacre Engineering & Manufacturing Company, Alhambra, California

**MACHINERY—Patenting Wire**
Whitacre Engineering & Manufacturing Company, Alhambra, California

**MACHINERY—Plating**
Hodge Bros. Machine Shop, Ossining, N. Y.
Universal Industrial Equipment Co., Secaucus, N. J.

**MACHINERY—Pointing**
Herborn, Maschinenfabrik, Herborn, Germany
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York,
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

**MACHINERY—Polishing Asbestos Wire**
Beard Machine Co., York, Pa.

**MACHINERY—Printing on Electric Wire**
Entwistle, James L., Esmond, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Company, West Hanover, Mass.
Gillies, Duncan M. Co., Inc., Boylston, Mass.

**MACHINERY—Re-Spooling**
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Colbourne Machine Company, Winsted, Conn.
Emory Company, Robert J., Newark, N. J.
Entwistle, James L., Esmond, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Herborn, Maschinenfabrik, Herborn, Germany
Hodge Bros. Machine Shop, Ossining, N. Y.
Industrial Winding Machinery Co., New York, N. Y.
National Mach'y Exch. (Used), New York N. Y.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

**MACHINERY—Rod Mill**
Herborn, Maschinenfabrik, Herborn, Germany
Morgan Construction Co., Worcester, Mass.

**MACHINERY—Rolling Mill**
Morgan Construction Co., Worcester, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

**MACHINERY—Rubber Insulating**
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Royle, John & Sons, Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Serving**
Pourtier Pere et Fils, Romainville (Seine), France
Wardwell Braiding Machine Co., Central Falls, R. I.

**MACHINERY—Spark Testing**
Davis Electric Co., Wallingford, Conn.
Entwistle, James L., Esmond, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Spring Making**
National Mach'y Exch. (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wells Company, Frank L., Kenosha, Wisc.

**MACHINERY—Staple**
Baird Machine Company, Stratford, Conn.
Nilson, A. H. Machine Co., Shelton, Conn.

**MACHINERY—Straightening & Cutting**
American Laubscher Corporation, New York 19, N. Y.
Lewis Machine Co., The, Cleveland, Ohio
Mettler Machine Tool Co., New Haven, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Porter, Inc., H. K., Somerville, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Wells Company, Frank L., Kenosha, Wisc.

**MACHINERY—Stranding**
Hanson & Edwards, Ltd., Warrington, England
Haskell-Dawes Machine Co., Philadelphia, Pa.
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
Larmuth & Bulmer Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Superior Tool & Manufacturing Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Swaging**
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

**MACHINERY—Take-Up and Pay-Out**
American Insulating Mach'y Co., Phila., Pa.
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Colbourne Machine Company, Winsted, Conn.
Collins Bros. Machine Co., Wire & Cable Machy. Div., Pawtucket, R. I.
Davis Electric Co., Wallingford, Conn.
Davis-Standard Division of Franklin Research Corporation, Mystic, Conn.
Entwistle, James L., Esmond, R. I.
Entwistle Manufacturing Corporation, Providence, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Kraft, J. A., Maschinenfabrik, OLPE/Westf. Germany
Larmuth & Bulmer Limited, Manchester, England
Litzler, C. A., Co., Inc., Cleveland, Ohio
Pourtier Pere et Fils, Romainville (Seine) France
Standard Mill Supply Co., Pawtucket, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.
Whitacre Engineering & Manufacturing Company, Alhambra, California

**MACHINERY—Taping**
American Insulating Mach'y Co., Phila., Pa.
Collins Bros. Machine Co., Wire & Cable Machy. Div., Pawtucket, R. I.
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Pourtier Pere et Fils, Romainville (Seine), France
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**MACHINERY—Testing Magnet Wire Coatings for Pin Holes**
Federal Mfg. Co., Wallingford, Conn.

**MACHINERY—Testing, Physical**
Scott Testers, Inc., Providence, R. I.

**MACHINERY—Thread Rolling**
Mettler Machine Tool, Inc., New Haven, Conn.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

**MACHINERY—Tinning Wire**
American Insulating Mach'y Co., Phila., Pa.
Cook Manufacturing Co., The, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Universal Industrial Equipment Co., Secaucus, N. J.
Whitacre Engineering & Manufacturing Company, Alhambra, California

**MACHINERY—Tinsel Rolling Mills**
American Insulating Mach'y Co., Phila., Pa.

**MACHINERY—Trolley Wire**
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

**MACHINERY—Tube Mill, Cold Drawing**
Mettler Machine Tool, Inc., New Haven, Conn.

**MACHINERY—Twinning**
(See Mach.—Bunching)

**MACHINERY—Twisters, Wire**
Cook Manufacturing Co., The, Paterson, N. J.
Edmands Company, The, Cranston, R. I.
Haskell-Dawes Machine Co., Philadelphia, Pa.

**MACHINERY—Used**
National Machinery Exchange, New York, N. Y.
Wire & Textile Machy., Inc., Pawtucket, R. I.

**MACHINERY—Welded Wire Mesh**
National Electric Welding Machines Co., Bay City, Michigan

**MACHINERY—for Wire Welding**
(See WELDERS—Butt and Spot and Machinery —Welding Wire Fabrics)

**MACHINERY—Winding Wire**
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
Entwistle, James L., Esmond, R. I.
Federal Manufacturing Company, Wallingford, Conn.
Industrial Winding Machinery Co., New York, N. Y.
Kraft, J. A., Maschinenfabrik, OLPE/Westf., Germany
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Standard Mill Supply Co., Pawtucket, R. I.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Wire Drawing**
American Laubscher Corporation, New York 19, N. Y.
Cook Manufacturing Co., The, Paterson, N. J.
Coulter & McKenzie Machine Co., Bridgeport, Conn.
Federal Mfg. Co., Wallingford, Conn.
Herborn, Maschinenfabrik, Herborn, Germany
Hodge Bros. Machine Shop, Ossining, N. Y.
Morgan Construction Co., Worcester, Mass.
Morgardshammars Mek Verkstads AB, Morgardshammar, Sweden
National Mach'y Exch. (Used), New York, N. Y.
Norton & Co., Ltd., Sir James Farmer, Manchester, England
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Superior Tool & Manufacturing Company, Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

# WHERE TO BUY, Continued

**For more complete information, consult the annual Wire and Wire Products Buyers' Guide.**

Wartenweiler, Emilio, Milan, Italy
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Whitacre Engineering & Manufacturing Company, Alhambra, California

**MACHINERY—Wire Forming**
Baird Machine Company, Stratford, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Nilson, A. H. Machine Co., Shelton, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.

**MACHINERY—Wire Rope**
Larmuth and Bulmer, Limited, Manchester, England
New England Butt Co., Division Wanskuck Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

**MACHINERY—Wrapping with Paper**
Larmuth (1947) Ltd., Swinton, England

**MATERIAL HANDLING EQUIPMENT—**
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

**MOTORS—Electric, A.C. — D.C.**
The Louis Allis Company, Milwaukee, Wisc.

**NAIL TOOLING—Tungsten Carbide**
Firth Sterling, Inc., Pittsburgh, Pa.
Pittsburgh Carbide Die Co., Monongahela, Pa.

**NAILS—Wire**
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Brothers, Inc., Cortland, N. Y.

**NIPPERS—Wire Cutting**
Robinson, M. W. Co., Rockfall, Conn.

**NOZZLES—For Extruding Machines**
Wire Tool Div., Bridgeport Jig Boring Co., Bridgeport, Conn.

**OVENS—Cable Lacquering and Enameling**
American Insulating Mach'y Co., Phila., Pa.
Carl Mayer Corp., The, Cleveland, Ohio
Colbourne Machine Company, Winsted, Conn.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Michigan Oven Company, Detroit, Mich.

**OVENS—Rod Bakers**
Carl Mayer Corp., The, Cleveland, Ohio

**OVENS—Welding Rod Coating**
Carl Mayer Corp., The, Cleveland, Ohio
Litzler, C. A., Co., Inc., Cleveland, Ohio

**PAILS—Packaging**
**(See Drums—Wire Packaging)**

**PAINT BONDING CHEMICALS—**
Amchem Products, Inc., Ambler, Pa.

**PAINTS—Heat Resisting**
Amchem Products, Inc., Ambler, Pa.

**PAPER—Creped Wrapping**
Ludlow Papers, Inc., Needham Heights, Mass.

**PAPER—For Coil Wrapping and Corrosion Prevention**
Ludlow Papers, Inc., Needham Heights, Mass.

**PAPER—Insulating**
Ludlow Papers, Inc., Needham Heights, Mass.
Twitchell, Inc., E. W., Philadelphia, Pa.

**PATENT—ATTORNEYS—**
Rommel, Allwine & Rommel, Washington, D. C.

**PAY-OUT SYSTEMS—**
(See MACHINERY—Take-Up & Pay-Out)

**PHOSPHATE COATING CHEMICALS**
(See COMPOUNDS—Phosphate Coating)

**PICKLING COMPOUNDS—**
See (Inhibitors—Pickling)

**PLASTICIZERS—**
Monsanto Chemical Company, Plastics Division, St. Louis, Mo.

**PLASTICS—for Wire Insulation**
Apex Tire & Rubber Co., Pawtucket, R. I.
Blane Corporation, The, Canton, Mass.
Cary Chemicals, Inc., New Brunswick, N. J.
duPont de Nemours Co., (Inc.), E. I., Polychemical Dept., Wilmington, Delaware
Monsanto Chemical Company, Plastics Division, Springfield, Mass.
Shawinigan Resins Corporation, Springfield, Mass.
Thompson Chemical Company, Pawtucket, R. I.
U. S. Industrial Chemicals Company, Division of National Distillers & Chemical Corporation, New York, N. Y.
United States Rubber Company, Naugatuck Chemical Division, New York, N. Y.

**PRINTING WHEELS—for Electric Wire**
Entwistle Manufacturing Corporation, Providence, R. I.
Gem Gravure Co., Inc., West Hanover, Mass.
Gillies, Duncan M. Co., Inc. Boylston, Mass.

**PULLERS AND GRIPS—For Wire**
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry. & Mach. Co., Trenton, N. J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

**RACKS—Wire Storage**
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Jarke Manufacturing Co., Chicago, Illinois

**REEL AND TENSION STANDS—**
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Mettler Machine Tool, Inc., New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Mill Supply Co., Pawtucket, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

**REEL CRUTCHES—**
Watson Machine Co., Paterson, N. J.

**REELS & SPOOLS—Aluminum Alloy**
Acrometal Products, Inc., Minneapolis, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
National Vulcanized Fibre Co., Lestershire Spool Div., Johnson City, N. Y.
Wardwell Braiding Machine Co., Central Falls, R. I.

**REELS & SPOOLS—Annealing and Stranding**
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio

**REELS—Metal Bound**
Durkee Mfg. Co., Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
National Vulcanized Fibre Co., Lestershire Spool Div., Johnson City, N. Y.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

**REELS—Plywood**
Carris Reels, Inc., Rutland, Vt.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

**REELS & SPOOLS—Steel (All Types)**
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Evans, George, Corp., Moline, Ill.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
National Vulcanized Fibre Co., Lestershire Spool Div., Johnson City, N. Y.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

**REELS—Steel, for Rope and Cable**
Evans, George, Corp., Moline, Ill.

**REELS—Wire Mill**
Acrometal Products, Inc., Minneapolis, Minn.
Apco Mossberg Co., Attleboro, Mass.
Boonton Molding Company, Boonton, N. J.
Bridge Mfg. Co., The, Hazardville, Conn.
Burlington Fabricators, Inc., Products Div., Burlington, N. J.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Molded Fiber Glass Tray Co., Linesville, Pa.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.
National Vulcanized Fibre Co., Lestershire Spool Div., Johnson City, N. Y.
Nilson, A. H. Machine Co., Shelton, Conn.
Republic Steel Corp., Pressed Steel Div., Cleveland, Ohio
Wardwell Braiding Machine Co., Central Falls, R. I.

**REELS & SPOOLS—Wood**
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., The, Hazardville, Conn.
Carris Reels, Inc., Rutland, Vt.
Durkee Mfg. Co. Inc., Pine River, Minn.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
McCaskie, Inc., William, Westport, Mass.
Strand-Buffalo Corporation, North Tonawanda, N. Y.

**REFRACTORIES—High Temperature**
Norton Company, Worcester, Mass.

**ROD BAKERS—**
(See OVENS—Rod Bakers)

**RODS—Stainless Steel**
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Pittsburgh Steel Co., Pittsburgh, Pa.

**RODS—Wire—Non-Ferrous**
Aluminum Company of America, Pittsburgh, Pa.
Platt Bros. & Co., The, Waterbury, Conn.
Scovill Mfg. Co., Waterbury, Conn.

**RODS—Steel**
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Niederrheinische Huette, A. G., Duisburg, Germany
Pittsburgh Steel Co., Pittsburgh, Pa.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

**ROPE—Wire**
Bethlehem Steel Co., Bethlehem, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.

**RUST PROOF COMPOUNDS—**
(See COMPOUNDS—RUST Preventing)

**RUST REMOVING COMPOUNDS—**
(See COMPOUNDS—RUST Preventing)

**SATURATION SYSTEMS—**
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc. (used) Pawtucket, R. I.

**SOAPS—Industrial and Wire Drawing**
(See COMPOUNDS—Wire Drawing)

**SPOOLS—Plastic**
Boonton Molding Company, Boonton, N. J.
Hubbard Spool Company Div., The American Pulley Co., Garrett, Ind.
Molded Fiber Glass Tray Co., Linesville, Pa.
National Vulcanized Fibre Co., Lestershire Spool Div., Johnson City, N. Y.
Standard Mill Supply Co., Pawtucket, R. I.

**STAMPINGS—Steel**
Acrometal Products, Inc., Minneapolis, Minn.
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.

**STOCK STORAGE SYSTEMS**
Jarke Manufacturing Co., Chicago, Illinois

**STRIP—Steel**
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Roebling's, John A. Sons Corp., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

**TABLES—Press Feeding**

**TANKS—Ceramic, for Galvanizing**
Ofenbau Fritz G.m.b.H., Hagen i.W., W. Germany.

**TANKS—Compound**
Watson Machine Co., Paterson, N. J.

**TESTERS—INSULATION**
(See MACHINERY—Spark Testers)

**TESTING EQUIPMENT**
(See MACHINERY Testing, Physical and Diameter Testing)

**TINSEL—Electric Conductor**
Montgomery Co., The, Windsor Locks, Conn.

**TINSEL WIRE—Resistance, Lame, Decorative Cords Thread—Bare Copper Silver and False Gold Coated, etc.**
(See TINSEL—Electric Conductor)

**TOOLS—Nail Machine**
Pittsburgh Carbide Die Co., Monongahela, Pa.

**TOOLS—Wire Cutting**
Porter, H. K., Inc., Somerville, Mass.

# WHERE TO BUY, Continued

**For more complete information, consult the annual Wire and Wire Products Buyers' Guide.**

**TRAMRAIL SYSTEMS—**
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

**TRANSMISSIONS—Variable speed (See Adjustable Speed Drives)**

**TRAVERSES & DRUMS—For Reels**
(See Drums & Traverses)

**TRAVERSE MECHANISMS—**
Davis Electric Co., Wallingford, Conn.
Emory Company, Robert J., Newark, N. J.
Hodge Bros. Machine Shop, Ossining, N. Y.
New England Butt Co., Division of Wanskuck Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.
Western Wire & Textile Machinery, Inc., So. San Francisco, Calif.
Wire & Textile Mach'y, Inc. (used) Pawtucket, R. I.

**VARNISHES & LACQUERS—for Electric Wire**
General Electric Company, Insulating Materials Section, Schenectady, N. Y.
Shawinigan Resins Corporation, Springfield, Mass.

**VULCANIZING PANS AND EQUIPMENT—**
American Insulating Mach'y Co., Phila, Pa.
Litzler, C. A., Co., Inc., Cleveland, Ohio
Mossberg Pressed Steel Corp., Division of Wanskuck Co., Attleboro, Mass.

**WELDERS—Spot and Butt and Welding Wire Fabrics**
Eisler Engineering Corp., Newark, N. J.
Micro Products Co., Chicago, Ill.
National Electric Welding Machines Co., Bay City, Michigan
H. A. Schlatter, Ltd., Zollikon-Zurich

**WHEELS—for Printing on Electric Wire**
Gem Gravure Company, West Hanover, Mass.

**WIRE—Aluminum**
Aluminum Company of America, Pittsburgh, Pa.
Malin & Co., The, Cleveland, Ohio
National Standard Company, Niles, Mich.
Scovill Mfg. Co., Waterbury, Conn.
United Wire & Supply Corporation, Providence, R. I.

**WIRE—Ball**
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

**WIRE—Barbed**
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

**WIRE—Brass and Bronze**
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Scovill Mfg. Co., Waterbury, Conn.
United Wire & Supply Corporation, Providence, R. I.

**WIRE—Cadmium**
Stamford Processing Co., Peekskill, N. Y.

**WIRE—Cast**
Youngstown Sheet & Tube Co., Youngstown, O.

**WIRE—Clad and Plated**
Sylvania Electric Products Inc., Warren, Pennsylvania

**WIRE—Cold Heading**
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Scovill Mfg. Co., Waterbury, Conn.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
United Wire & Supply Corporation, Providence, R. I.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

**WIRE—Copper**
Sylvania Electric Products Inc., Warren, Pennsylvania
United Wire & Supply Corporation, Providence, R. I.

**WIRE—For Electrical Conductors**
Aluminum Company of America, Pittsburgh, Pa.
United Wire & Supply Corporation, Providence. R. I.

**WIRE—Flat**
American Chain & Cable, Page Steel and Wire Division, Monessen, Pa.
Montgomery Co., The, Windsor Locks, Conn.
National Standard Company, Niles, Mich.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Sylvania Electric Products Inc., Warren, Pennsylvania
United Wire & Supply Corporation, Providence, R. I.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

**WIRE—Galvanized**
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
National Standard Company, Niles, Mich.
Roebling's, John A. Sons Corp., Trenton, N. J.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

**WIRE—High Carbon**
American Chain & Cable, Page Steel and Wire Division, Monessen, Pa.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

**WIRE—Manufacturers**
Aluminum Company of America, Pittsburgh, Pa.
American Chain & Cable, Page Steel and Wire Division, Monessen, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Lock Washer Company, The, Newark N. J.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corporation, Pressed Steel Div., Cleveland, Ohio
Roebling's, John A., Sons Corp., Trenton, N. J.
Scovill Mfg. Co., Waterbury, Conn.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Sylvania Electric Products Inc., Warren, Pennsylvania
United Wire & Supply Corporation, Providence, R. I.
U. S. Steel Corp., N. Y., N. Y.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

**WIRE—Metalizing**
American Chain & Cable, Page Steel and Wire Division, Monessen, Pa.
Platt Bros. & Co., The, Waterbury, Conn.
Stamford Processing Co., Peekskill, N. Y.

**WIRE—Music**
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., The, Cleveland, Ohio
National Standard Company, Niles, Mich.
Worcester Wire Works Div., National-Standard Company, Worcester, Mass.

**WIRE—Needle**
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

**WIRE—Nickel Alloy**
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.

**WIRE—Nickel Silver and Phosphor Bronze**
Malin & Co., The, Cleveland, Ohio
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
United Wire & Supply Corporation, Providence, R. I.

**WIRE—Oil Tempered**
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Roebling's, John A., Sons Corp., Trenton, N. J.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

**WIRE—Special Shapes**
American Chain & Cable, Page Steel and Wire Division, Monessen, Pa.
Continental Steel Corp., Kokomo, Ind.
National Lock Washer Company, The, Newark, N. J.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Sylvania Electric Products Inc., Warren, Pennsylvania
United Wire & Supply Corporation, Providence, R. I.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

**WIRE—Spring**
American Chain & Cable, Page Steel and Wire Division, Monessen, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Roebling's, John A., Sons Corp., Trenton, N. J.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
United Wire & Supply Corporation, Providence, R. I.
Webb Wire Div., Carpenter Steel Co., New Brunswick, N. J.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

**WIRE—Stainless Steel**
American Chain & Cable, Page Steel and Wire Division, Monessen, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Firth Sterling, Inc., Pittsburgh, Pa.
National Lock Washer Company, The, Newark, N. J.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Webb Wire Div. Carpenter Steel Co., New Brunswick, N. J.

**WIRE—Steel—Also Coppered and Galvanized Steel**
American Chain & Cable, Page Steel and Wire Division, Monessen, Pa.
American Steel & Wire Div., United States Steel Corp., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester Mass.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
National Standard Company, Niles, Mich.
Pittsburgh Steel Co., Pittsburgh, Pa.
Porter Company, Inc., H. K., Riverside—Alloy Metal Division, Riverside, N. J.
Roebling's, John A., Sons Corp., Trenton, N. J.
Sheffield Division, Armco Steel Corporation, Kansas City, Mo.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

**WIRE—Straightening and Cutting**
American Chain & Cable, Page Steel and Wire Division, Monessen, Pa.
Colorado Fuel and Iron Corporation, Pacific Coast Division, Oakland, Calif.
Jones & Laughlin Steel Corporation, Pittsburgh, Pa.
United Wire & Supply Corporation, Providence, R. I.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., New York, N. Y.

**WIRE—Zinc**
Platt Bros. & Co., The, Waterbury, Conn.
Stamford Processing Co., Peekskill, N. Y.

**WOOD—for Guide, Rolls, Bushings, Wear Parts, etc.**

**WRAPPING PAPER—Creped**
(See PAPER—Creped Wrapping)

**YARN TESTERS—**
Scott Testers, Inc., Providence, R. I.

# The WATSON MACHINE COMPANY

ESTABLISHED 1845

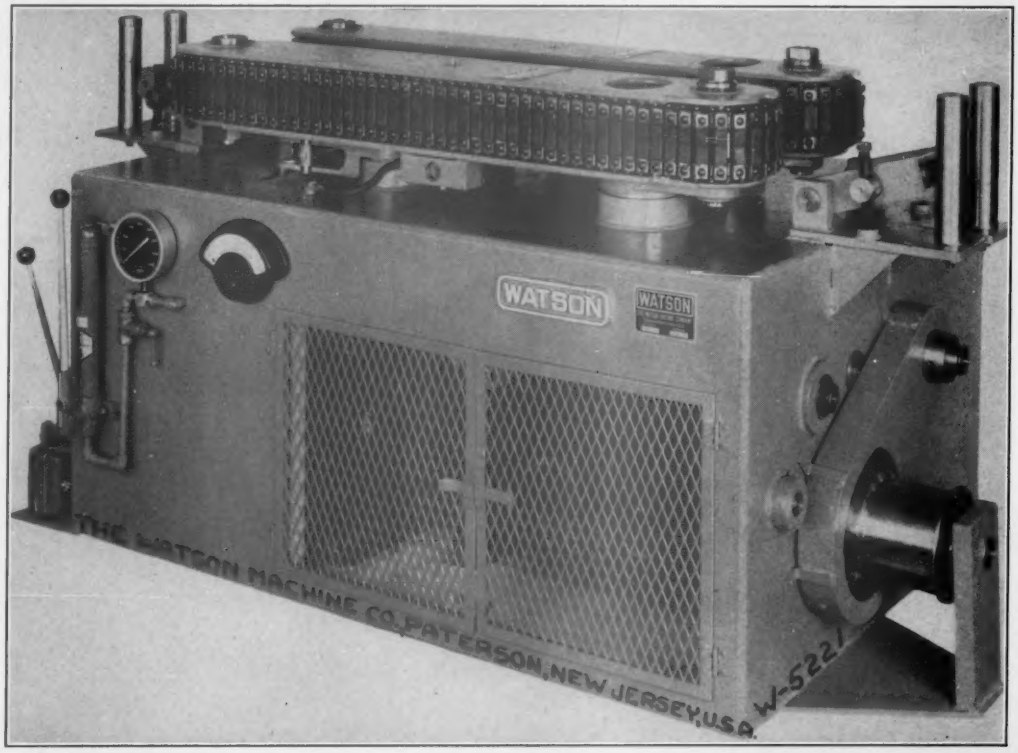
PATERSON, NEW JERSEY, U. S. A.

ELECTRICAL WIRE AND CABLE, WIRE ROPE, CORDAGE
AND MASTICATING MACHINERY MANUFACTURERS

WATSON

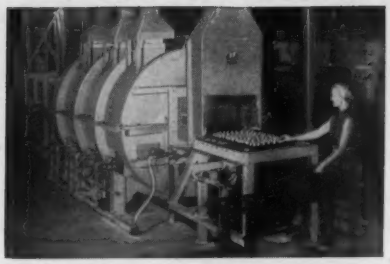
## TRACTOR CAPSTANS

MANY YEARS OF EXPERIENCE IN BUILDING THESE UNITS ENABLE US TO OFFER MODELS WHICH MEET REQUIREMENTS EFFICIENTLY AND ECONOMICALLY.

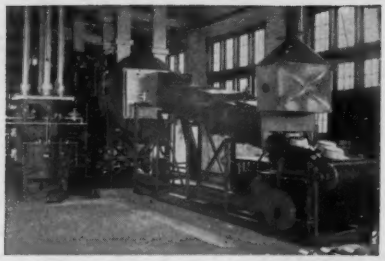



**NO. W-5221 SHOWS A SELF-POWERED, REEVES DRIVEN UNIT FOR CABLES TO 6" DIAMETER, AT SPEEDS TO 30 F.P.M., AND EQUIPPED WITH A LEAD WIRE PULL-IN WINCH.**

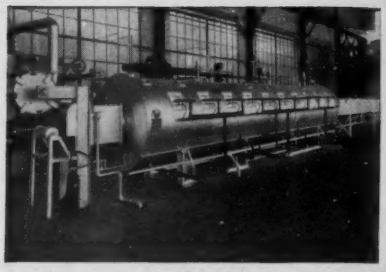
8-58



EF gas fired muffle type continuous furnace, one of several types we build for sintering non-ferrous and iron powder products.



This type bright anneals stainless steel stampings, flatware, drawn and other products—economically, uniformly and continuously.



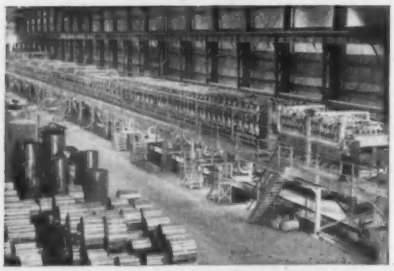
Another type we build for bright annealing stainless steel. This EF furnace also handles other grades requiring lower temperatures.

*If* **YOU** *Want*

1. Modern Proven Design
2. Latest Technological Improvements
3. High Hourly Output
4. High Heating Efficiency
5. Dependable Automatic Operation
6. Skillful Fabrication and Installation

you need an **EF** **PRODUCTION FURNACE**

## we build any size or type for any production requirement



A large combination gas fired and electrically heated continuous galvanizing furnace installation (over 300 feet long). As usual this equipment was completed and in production on schedule, and the first coil run through was accepted as first class salable material.

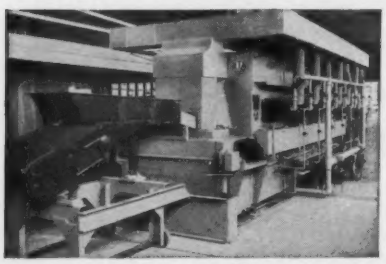
EF production furnaces assure users utmost uniformity, efficiency, economy, and maximum return per dollar invested. Our complete line of continuous and batch furnaces — gas fired, oil fired or electrically heated — enables us to recommend, without bias, the size, type and fuel that will meet your particular problem best. Furnished complete with special atmosphere equipment and materials handling facilities. Let us work with you on your next annealing, normalizing, coating or other heat processing project. You'll find . . .

**it pays to submit your production furnace problems to experienced EF engineers.**

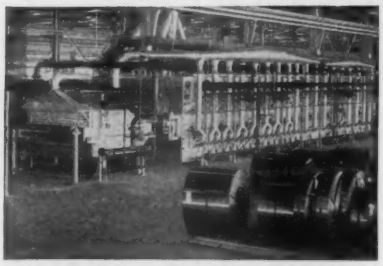
**EF** **THE ELECTRIC FURNACE CO.**

GAS FIRED, OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION *Salem - Ohio*

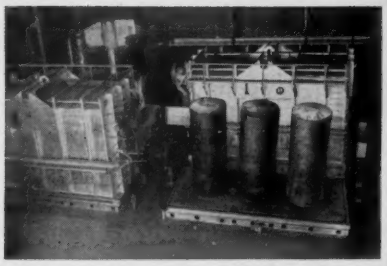
Canadian Associates • Canefco Limited • Toronto 13, Canada



EF gas fired radiant tube combination hardening and dry cyaniding unit fitted with an automatic feeder that distributes the parts evenly on the chain-belt conveyor; and a dual quench.



EF gas fired unit—bright anneals wide or narrow strip in single or multiple strands. Other continuous and batch types for ferrous or non-ferrous including stainless.



EF gas fired special atmosphere rectangular bell type strip annealers with individually controlled forced circulation 3-stack bases each with capacity of 135,000 lbs. per charge.